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The Architects' JOURNAL for September 11, 1958

THE ARCHITECTS' JOURNAL



andard contents

very issue does not necessarily contain all these contents, but they are the regular features which continually recur

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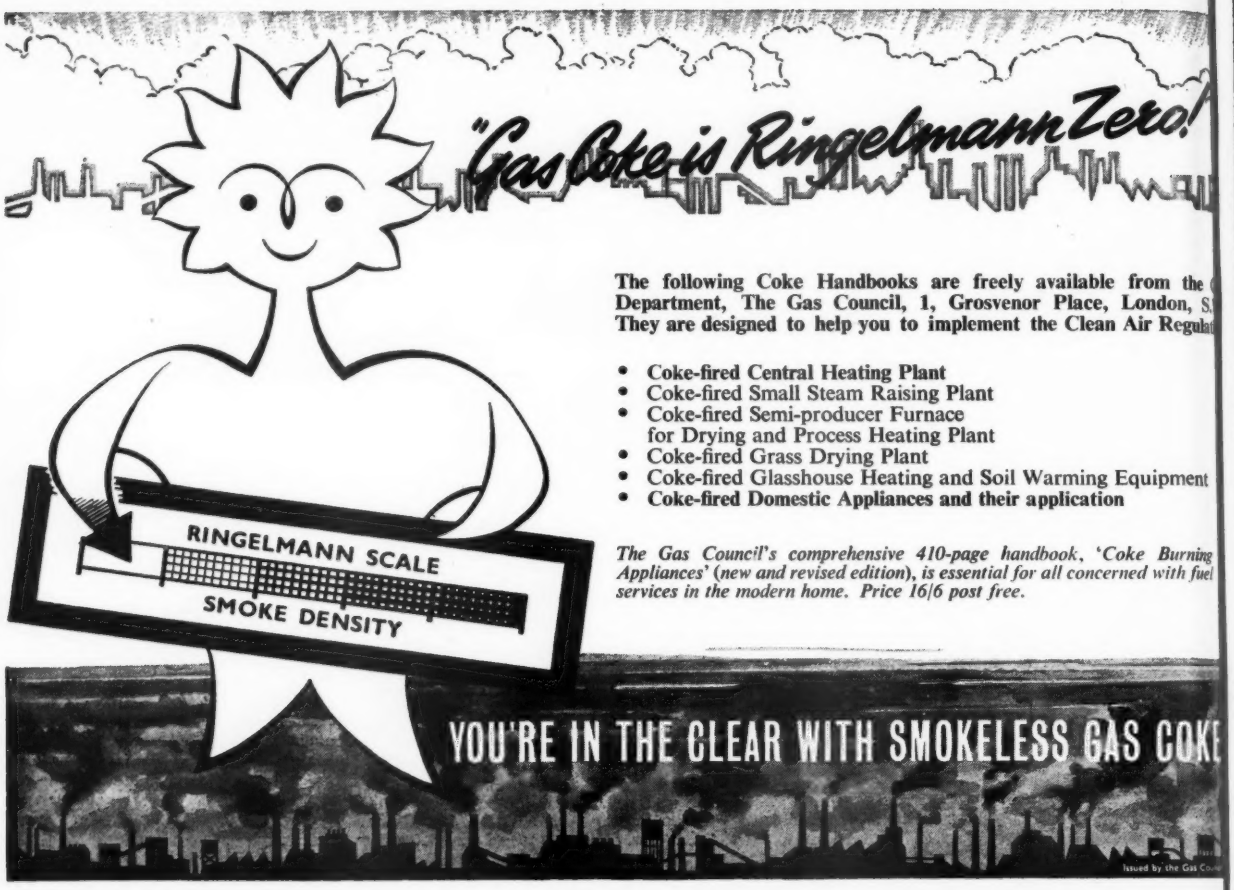
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★ A glossary of abbreviations of Government Departments and Societies and Committees of all kinds, together with their full address and telephone numbers. The glossary is published in two parts—A to Ii one week, Il to Z the next. In all cases where the town is not mentioned the word LONDON is implicit in the address.

AA	Architectural Association, 34/6, Bedford Square, W.C.1.	Museum 0974
AAI	Association of Art Institutions. Secy.: W. L. Stevenson, College of Art, Hope Street, Liverpool 1.	Royal 1826
ABS	Architects' Benevolent Society. 66, Portland Place, W.1.	Langham 5533
ABT	Association of Building Technicians. 1, Ashley Place, S.W.1.	Victoria 0447-8
ACGB	Arts Council of Great Britain. 4, St. James's Square, S.W.1.	Whitehall 9737
ADA	Aluminium Development Association. 33, Grosvenor Street, W.1.	Mayfair 7501/8
ARCUK	Architects' Registration Council. 68, Portland Place, W.1.	Langham 5861
BAE	Board of Architectural Education. 66, Portland Place, W.1.	Langham 5721
BC	Building Centre. 26, Store Street, Tottenham Court Road, W.C.1.	Museum 5400
BCC	British Colour Council. 13, Portman Square, W.1.	Welbeck 4185
BCCF	British Cast Concrete Federation. 105, Uxbridge Road, Ealing, W.5.	Ealing 9621
BCIRA	British Cast Iron Research Association. Alvechurch, Birmingham.	Redditch 716
BDA	British Door Association. 10, The Boltons, S.W.10.	Fremantle 8494
BEDA	British Electrical Development Association. 2, Savoy Hill, W.C.2.	Temple Bar 9434
BIA	British Ironfounders' Association. 145, Vincent Street, Glasgow, C.2.	Glasgow Central 2891
BID	Building Industries Distributors. 52, High Holborn, W.C.1.	Chancery 7772
BINC	Building Industries National Council. 11, Weymouth Street, W.1.	Langham 2785
BOT	Board of Trade. Whitehall Gardens, Horseguards Avenue, Whitehall, S.W.1.	Trafalgar 8855
BRS	Building Research Station. Bucknalls Lane, Watford.	Garston 4040
BSA	Building Societies Association. 14, Park Street, W.1.	Mayfair 0515
BSI	British Standards Institution. British Standards House, 2, Park St., W.1.	Mayfair 9000
BTE	Building Trades Exhibition. 32, Millbank, S.W.1.	Tate Gallery 8134
CABAS	City and Borough Architects Society. C/o S. A. G. Cook, A.R.I.B.A., Borough Architect and Director of Housing, Town Hall, High Holborn, W.C.1.	Holborn 3411
CAS	County Architects' Society. C/o S. Vincent Goodman, F.R.I.B.A., Shire Hall, Bedford.	Bedford 67444
CCA	Cement and Concrete Association. 52, Grosvenor Gardens, S.W.1.	Belgravia 6661
CCP	Council for Codes of Practice. Lambeth Bridge House, S.E.1.	Reliance 7611 Ext. 1284
CDA	Copper Development Association. 55, South Audley Street, W.1.	Grosvenor 8811
COID	Council of Industrial Design. 28, Haymarket, S.W.1.	Trafalgar 8000
CPRE	Council for the Preservation of Rural England. 4, Hobart Place, S.W.1.	Sloane 4280
CUC	Coal Utilization Council. 3, Upper Belgrave Street, S.W.1.	Sloane 9116
CVE	Council for Visual Education. 13, Suffolk Street, Haymarket, S.W.1.	Reading 72255
DIA	Design and Industries Association. 13, Suffolk Street, S.W.1.	Whitehall 0540
EJMA	English Joinery Manufacturers' Association (Incorporated). Sackville House, 40, Piccadilly, W.1.	Regent 4448
EPNS	English Place-Name Society. 7, Selwyn Gardens, Cambridge.	
FAS	Faculty of Architects and Surveyors. 68, Gloucester Place, W.1.	Welbeck 9966
FASS	Federation of Associations of Specialists and Sub-Contractors, 14, Bryanston Street, W.1.	Welbeck 1781
FBBDO	Fibre Building Board Development Organization Ltd. (Fidor), 47, Princes Gate, Kensington, S.W.7.	Kensington 4577
FBI	Federation of British Industries. 21, Tothill Street, S.W.1.	Whitehall 6711
FC	Forestry Commission. 25, Savile Row, W.1.	Regent 0221
FCMI	Federation of Coated Macadam Industries. 37, Chester Square, S.W.1.	Sloane 1002
FDMA	The Flush Door Manufacturers Association Ltd. Trowell, Nottingham.	Ilkeston 623
FLD	Friends of the Lake District. Pennington House, nr. Ulverston, Lancs.	Ulverston 201
FMB	Federation of Master Builders. 33, John Street, W.C.1. Tel.: Chancery 7583 (6 lines)	
FPC	The Federation of Painting Contractors, St. Stephen's House, S.W.1.	Whitehall 3902
FRHB	Federation of Registered House Builders. 82, New Cavendish Street, W.1.	Langham 4341
GPDA	Gypsum Plasterboard Development Association. 11, Ironmonger Lane, E.C.2.	Monarch 8888
GC	Gas Council. 1, Grosvenor Place, S.W.1.	Sloane 4554
GG	Georgian Group. 2, Chester Street, S.W.1.	Belgravia 3081
HC	Housing Centre. 13, Suffolk Street, Pall Mall, S.W.1.	Whitehall 2881
IAAS	Incorporated Association of Architects and Surveyors. 29, Belgrave Square, S.W.1.	Belgravia 3755
ICA	Institute of Contemporary Arts. 17-18, Dover Street, Piccadilly, W.1.	Grosvenor 6186
ICE	Institution of Civil Engineers. 1, Great George Street, S.W.1.	Whitehall 4577
IEE	Institution of Electrical Engineers. Savoy Place, Victoria Embankment, W.C.2.	Temple Bar 7676
IES	Illuminating Engineering Society. 32, Victoria Street, S.W.1.	Abbey 5215
IGE	Institution of Gas Engineers. 17, Grosvenor Crescent, S.W.1.	Sloane 8266
IHVE	Institution of Heating and Ventilating Engineers. 49, Cadogan Square.	Sloane 1601/3158
IIBDID	Incorporated Institute of British Decorators and Interior Designers. 100, Park Street, Grosvenor Square, W.1.	Mayfair 7086



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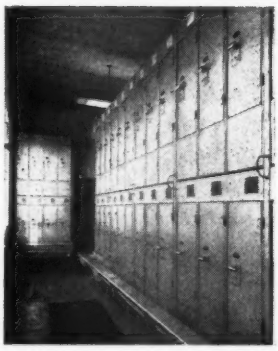
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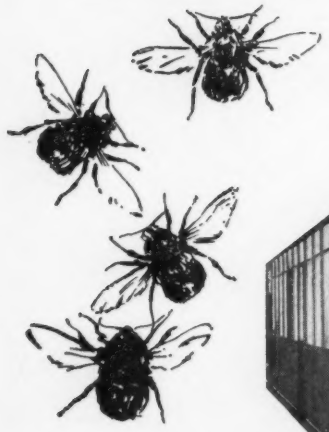
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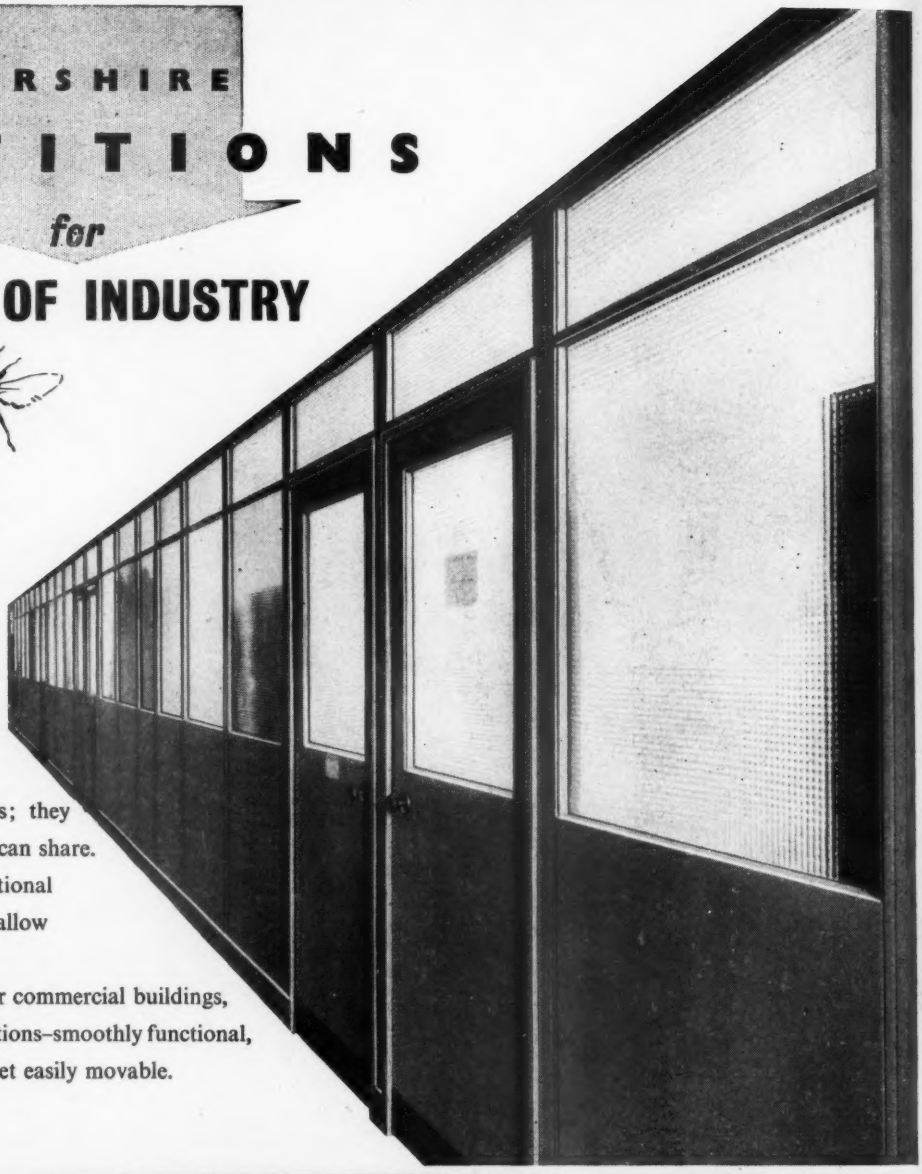
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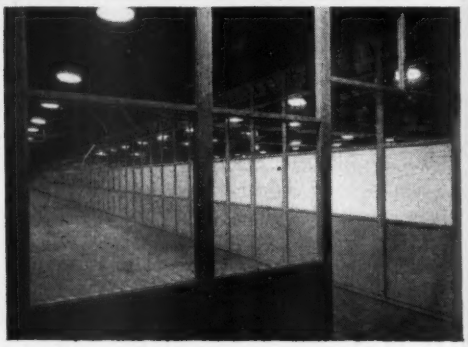




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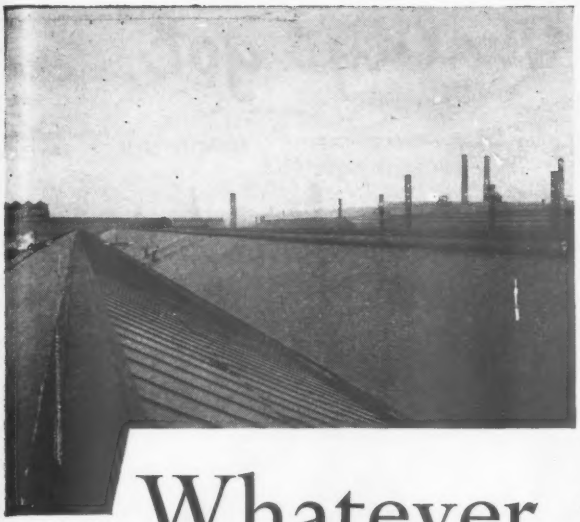






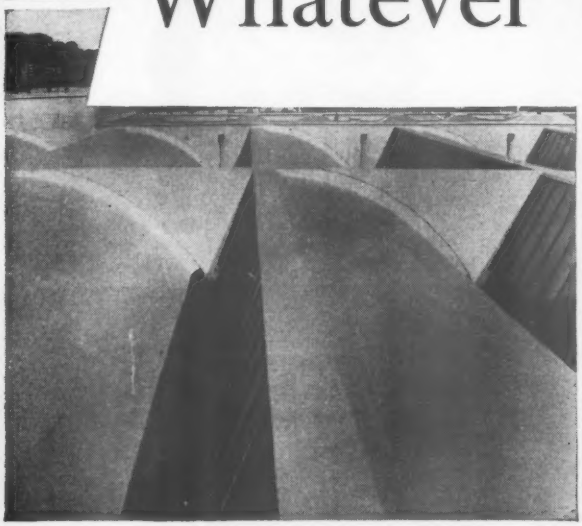
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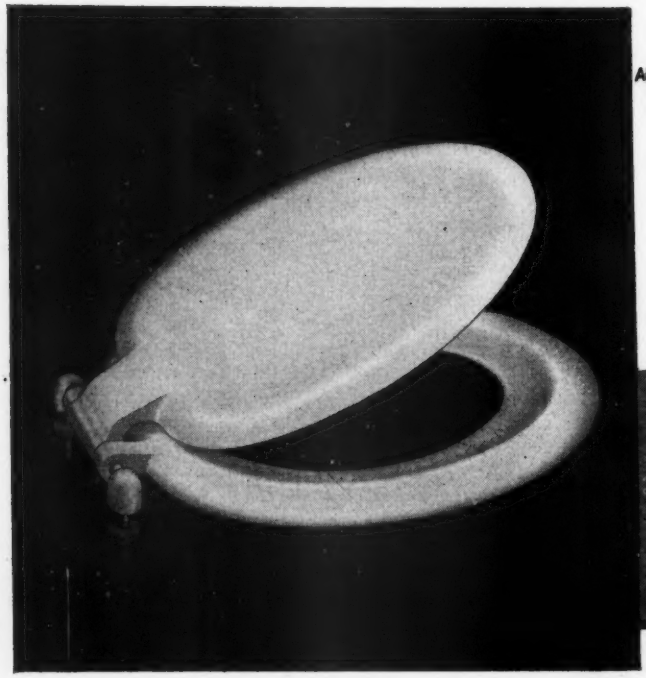
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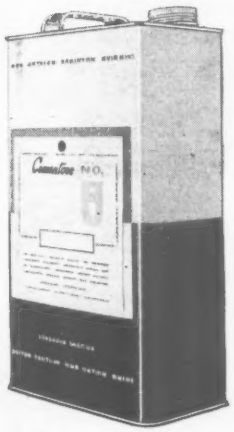
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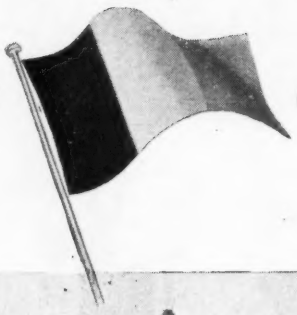
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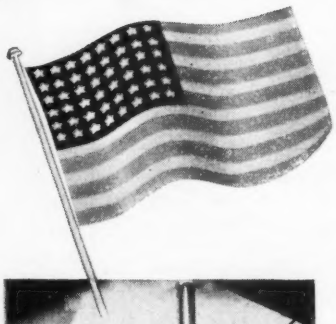


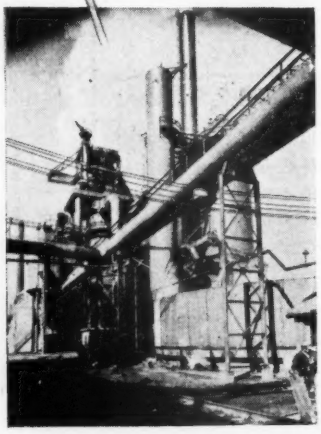
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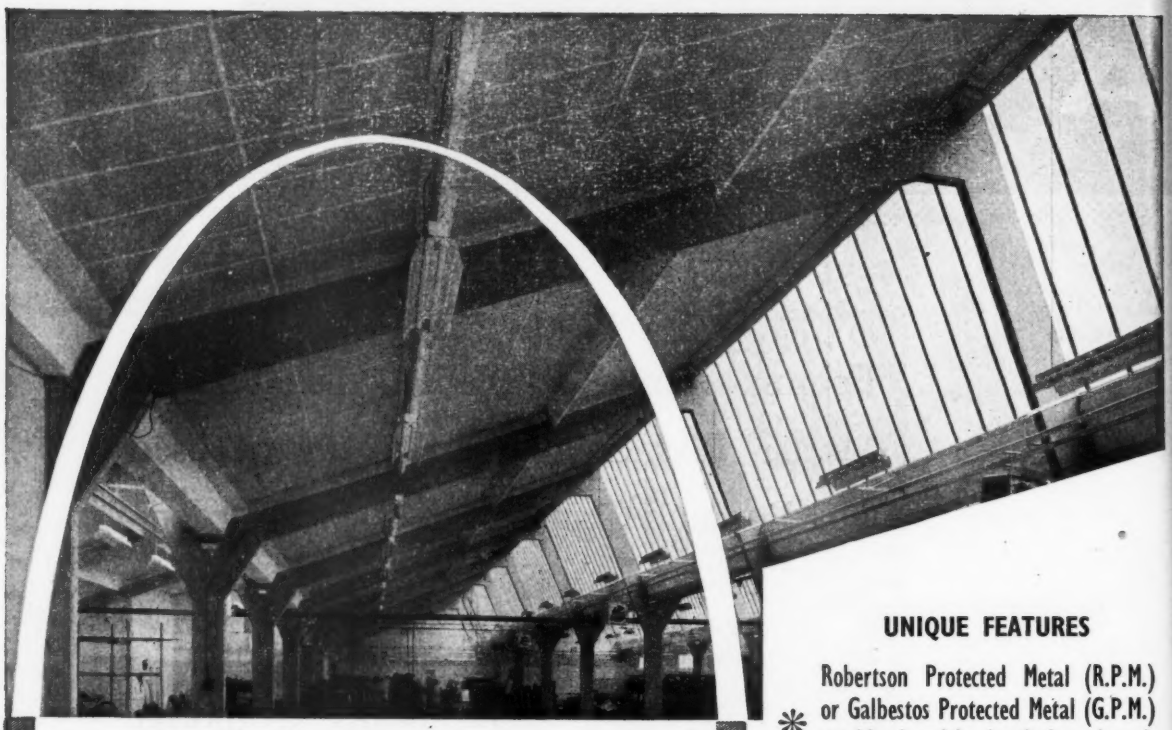
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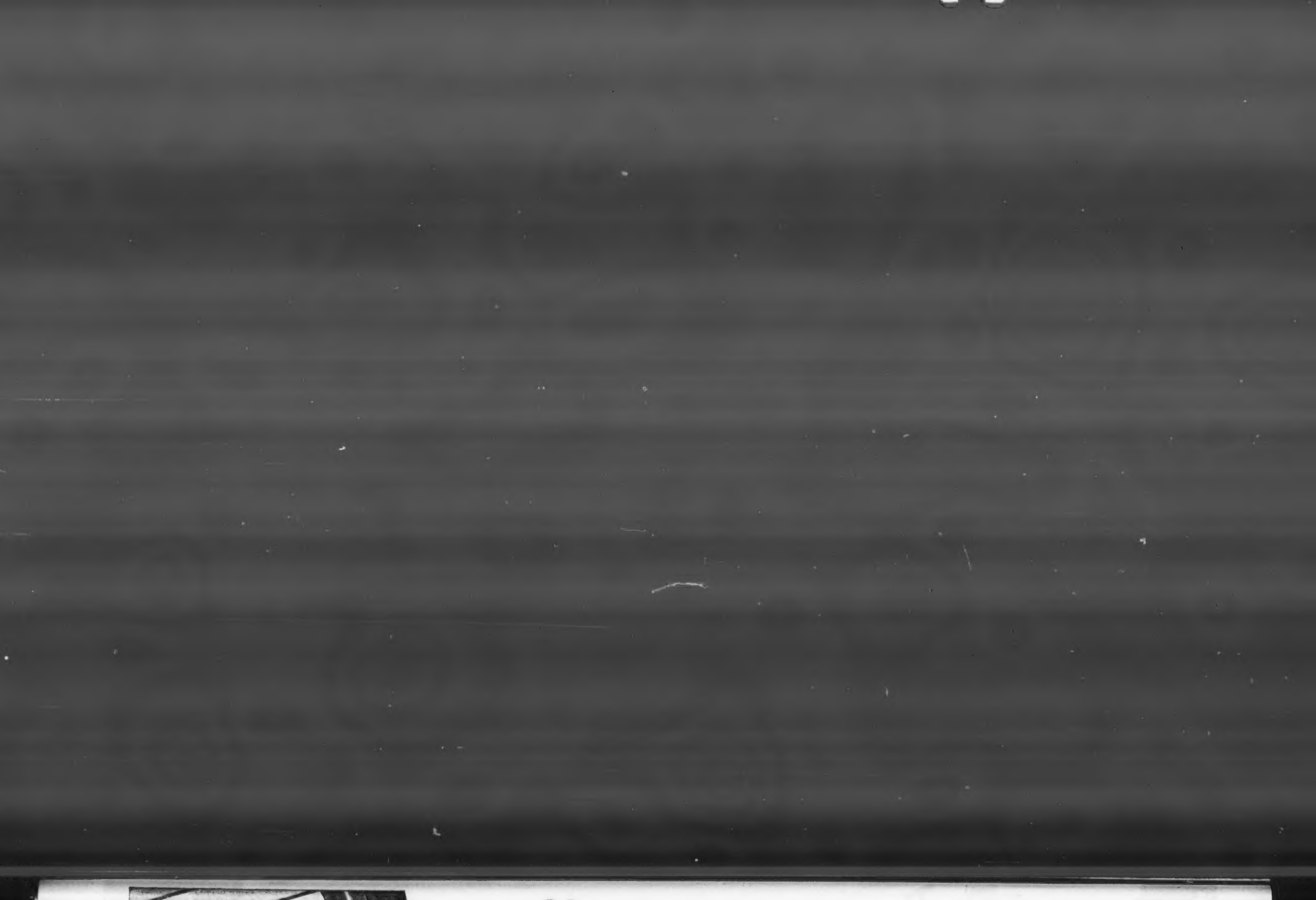
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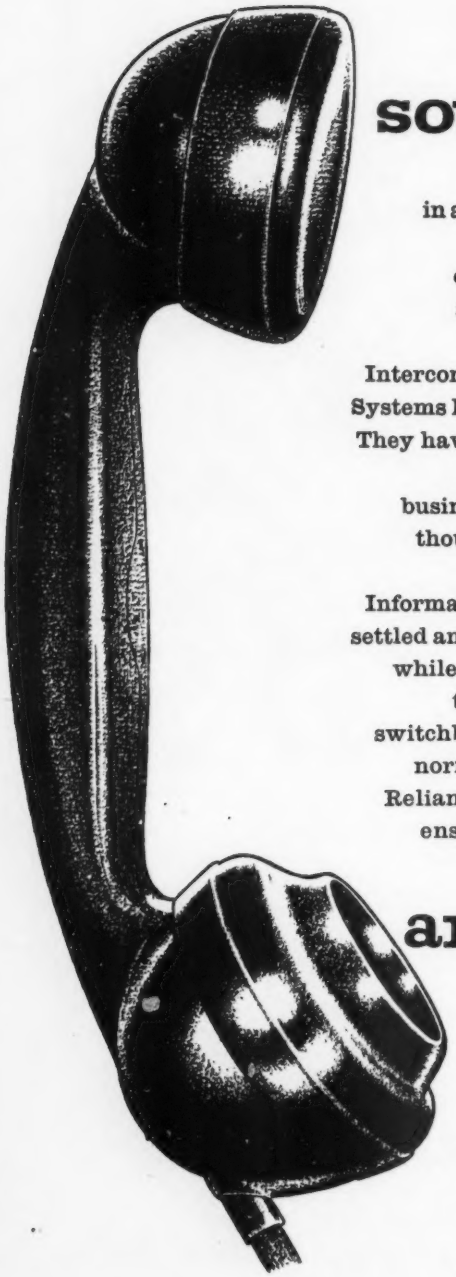
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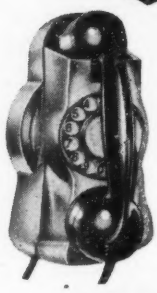


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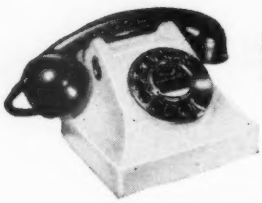
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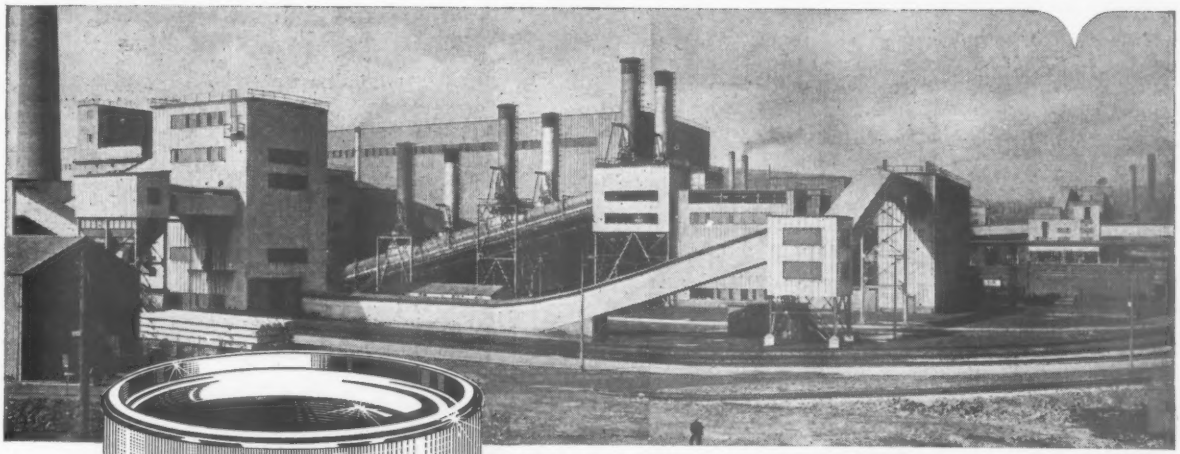
Our South Coast test farm provides extreme conditions.



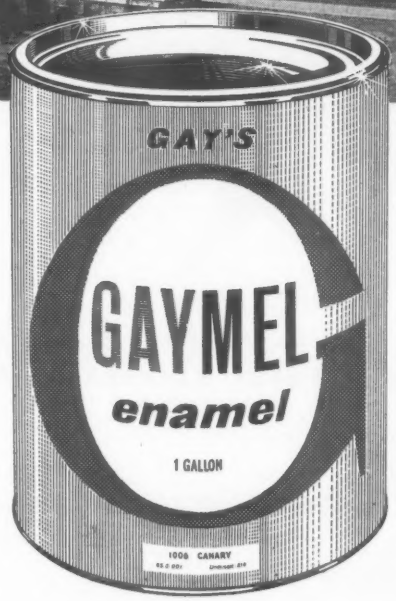
A house on the Hampshire coast.



Proved in field tests... On residential property... On industrial buildings



The Ore Preparation Plant at the Margam Works of the Steel Company of Wales.



GAYMEL *enamel*

proves best

Gay's new, brilliant gloss finish, GAYMEL is the product of many years' planned research. Selected from hundreds of formulations tested in Gay's South Coast proving station, Gaymel was then given practical trials on residential and industrial property.

Alongside standard, accepted materials, Gaymel proves best. In city smoke as on exposed coastal sites Gaymel reveals outstanding tenacity in gloss and colour retention, year after year.

MANUFACTURED BY R. GAY & CO.
WESTMORLAND HOUSE, 127/131 REGENT ST.
LONDON, W.1. *Telephone: Regent 0831*

another ***sound paint—by GAY'S***

BRANCHES IN • BIRMINGHAM • BRISTOL • BELFAST • GLASGOW • LEEDS • MANCHESTER

From Washington...

Free from dust

Obviously the Washington Wall Radiator can be easily cleaned— an essential factor in hospitals and schools, and wherever hygiene is necessary. The stream of warm air caused by convection carries no dust to pollute the atmosphere

Attractive

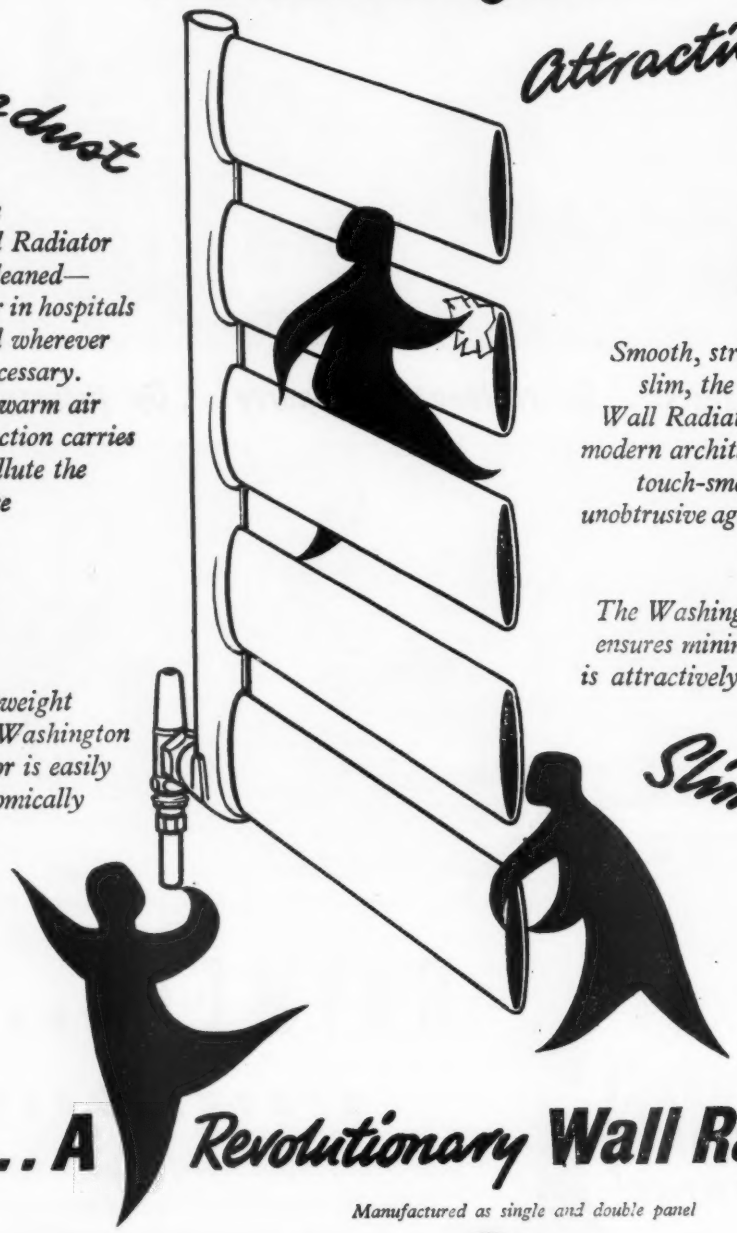
Smooth, streamlined and slim, the Washington Wall Radiator ideally matches modern architectural trends; its touch-smooth finish is unobtrusive against any background

Light

Being of lightweight pressed steel the Washington Wall Radiator is easily supported, economically handled

The Washington Wall Radiator ensures minimum projection and is attractively slim in appearance

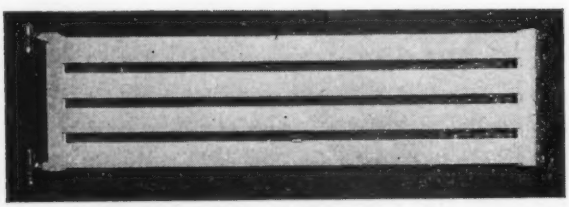
Slim



...A Revolutionary Wall Radiator

WSR

Manufactured as single and double panel



WASHINGTON ENGINEERING LTD.

P.O. BOX NO. 4, WASHINGTON CO. DURHAM.

Telephone: Washington 2362-3. Telegrams: Wearco, Washington Station.

(Full range of pressed steel column radiators also available)

SOLE AGENTS: Messrs. BROWN & TAWSE TUBES LTD., BRANCHES AT DUNDEE, GLASGOW, LONDON, MANCHESTER & BIRMINGHAM.

WEL 3



Don't delay – Post Today!

To Dept. A.J.
WASHINGTON ENGINEERING LTD.
P.O. Box No. 4, Washington, Co. Durham.

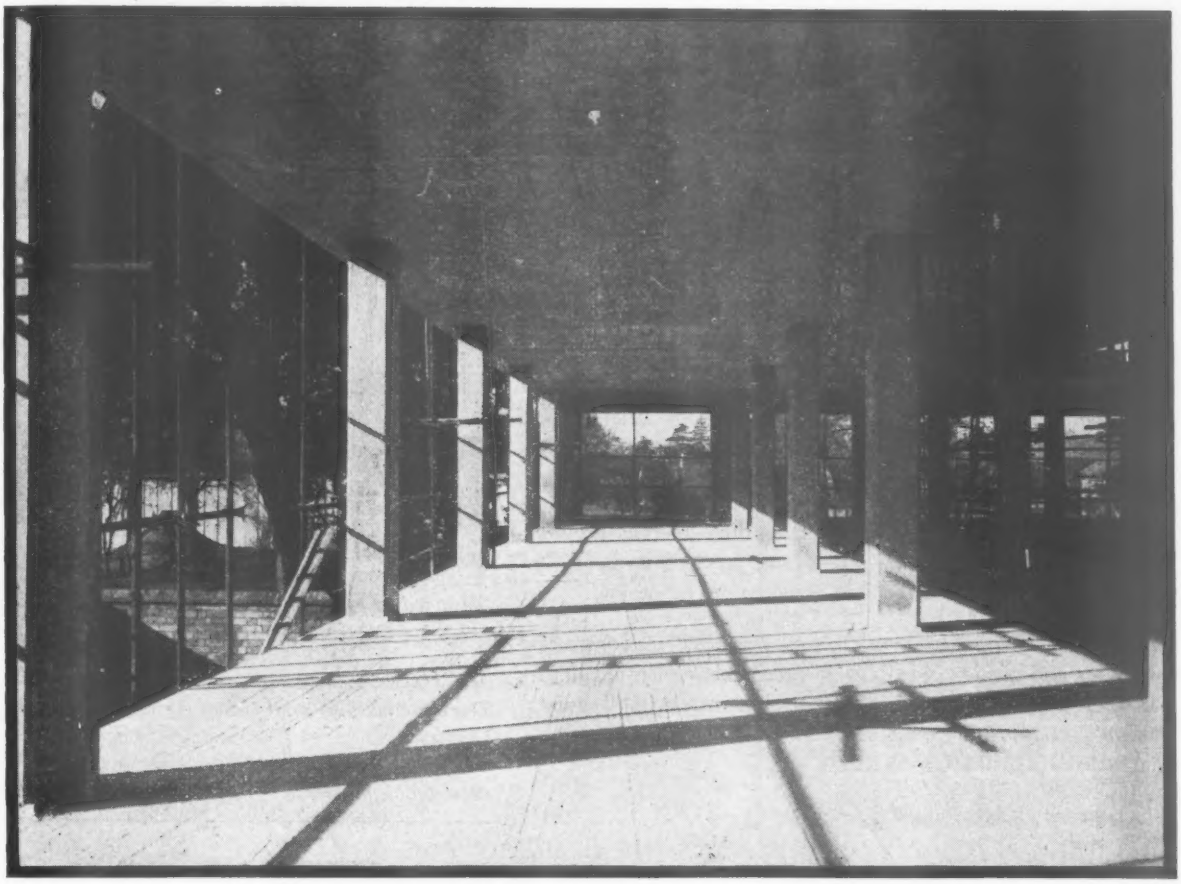
Please send me full details of the Washington WALL Radiator.

NAME_____

ADDRESS_____

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Construction in progress



Offices, Stratford on Avon,
for The National Farmers Union Mutual Insurance Society Limited.

Architects: Francis W. B. Yorke, Harper & Harvey.

Reinforced concrete by specialists. The product of a co-ordinated construction and design team, progressive in its approach, yet schooled in the styles, skills, *and economies* arising from Truscon's fifty years' specialist experience. In short, concrete of character

by Truscon

The Trussed Concrete Steel Company Limited, Truscon House, Lower Marsh, London SE.1 Telephone: WATerloo 6922

AS GOOD AS A SOLID BRICK WALL!

A well known City Chairman once complained to us that intense traffic noise below his windows and excessive audibility between adjacent offices and his own was affecting his efficiency, his privacy and his peace of mind.

We therefore designed and built for him, under a WRITTEN GUARANTEE to solve his problems, sound-proof doors and windows like those illustrated here.

Numerous tests on site and careful laboratory analysis proved that we must reduce the existing sound pressure level of 80 decibels to 35 decibels to achieve the comfort he desired.

So, to fulfil our undertaking, it was necessary to construct each door and window, not only to acceptable dimensions and a high standard of design, but to provide a MINIMUM sound transmission loss of 45 decibels—no less, in fact, than that of a SOLID 4½" BRICK WALL.

Which we very successfully did!



Photo by Courtesy of The Metal Box Co. Ltd.

"Sound-proof communicating door, designed to match existing decor."

These are just two examples of the work of Sound Control Limited, who can analyse, diagnose and cure most problems in sound. No matter what your noise problem may be, we invite you to consult us.

SOUND CONTROL LIMITED

A MEMBER OF THE THERMOTANK GROUP OF COMPANIES

CONTRACTORS IN ACOUSTICS

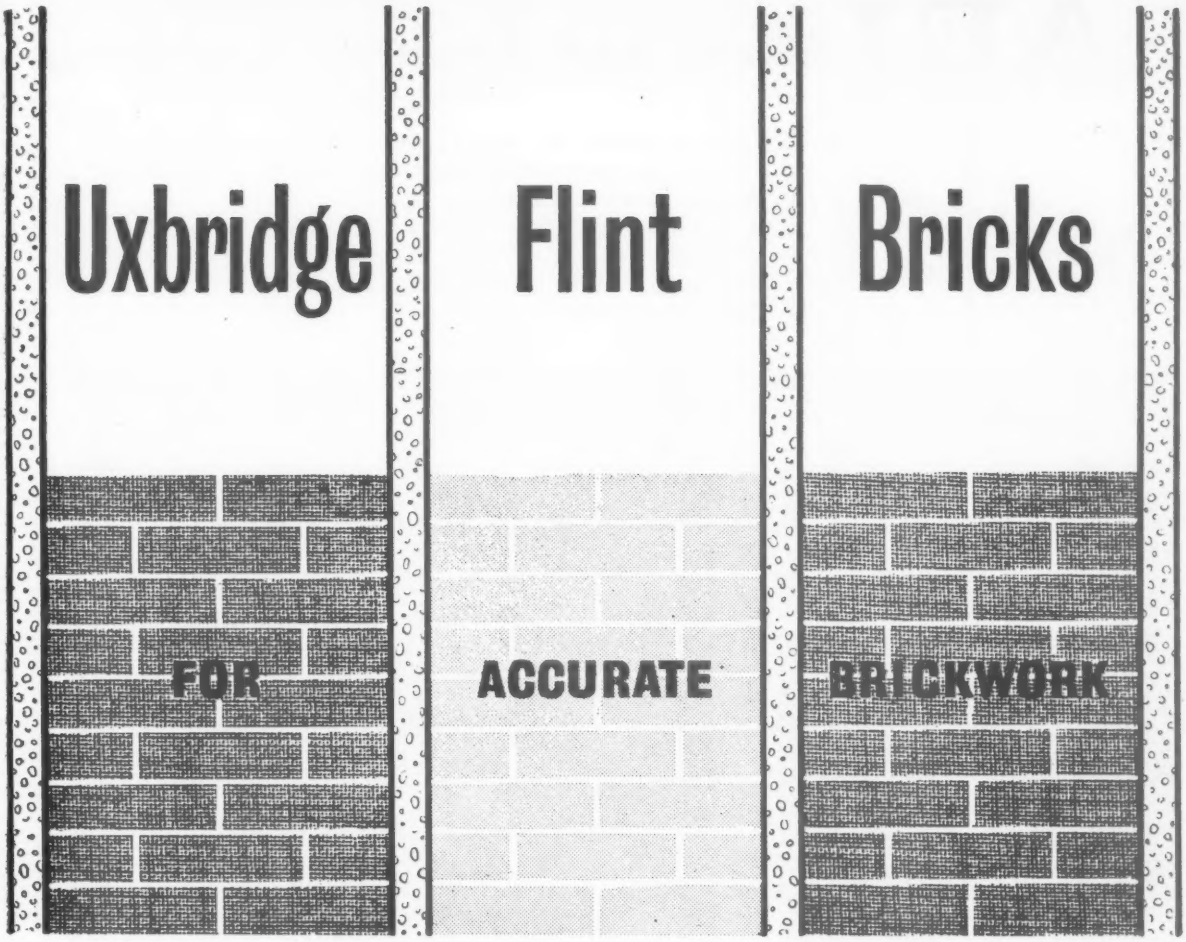


Photo by Courtesy of The Metal Box Co. Ltd.

Colneside Works, West Drayton, Middlesex
Telephone : West Drayton 3685–9 (5 *lines*)

Scottish Office: 10 Bothwell Street, Glasgow
Telephone : Central 6571/2

"Typical sound-proof window units designed and built to provide the sound transmission loss required."



Uxbridge Flint Bricks are particularly suitable for modular designed buildings. They are exceptionally accurately made and therefore can be laid to controlled dimensions. The bricks are available in many shades within the following colour range:

CREAM, BUFF, GOLDEN, BROWN, TERRACOTTA, LILAC, PURPLE, GREY, BLUE-BLACK

Standard $2\frac{5}{8}$" bricks are normally supplied, but 2" and $2\frac{7}{8}$" bricks can be quoted on request, also other special sizes and shapes to suit requirements.

CAPE BUILDING PRODUCTS LIMITED
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Birmingham: 11 Waterloo Street, Birmingham 2. Tel. Midland 6565-6-7
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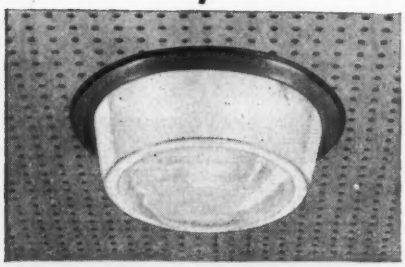
TA.901

A·E·I Lamp and Lighting Co Ltd

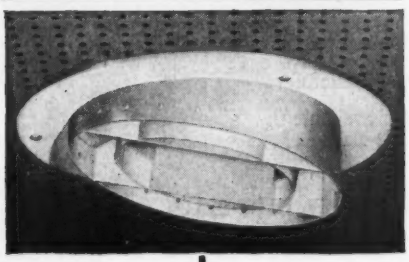
Shop and Display Lighting

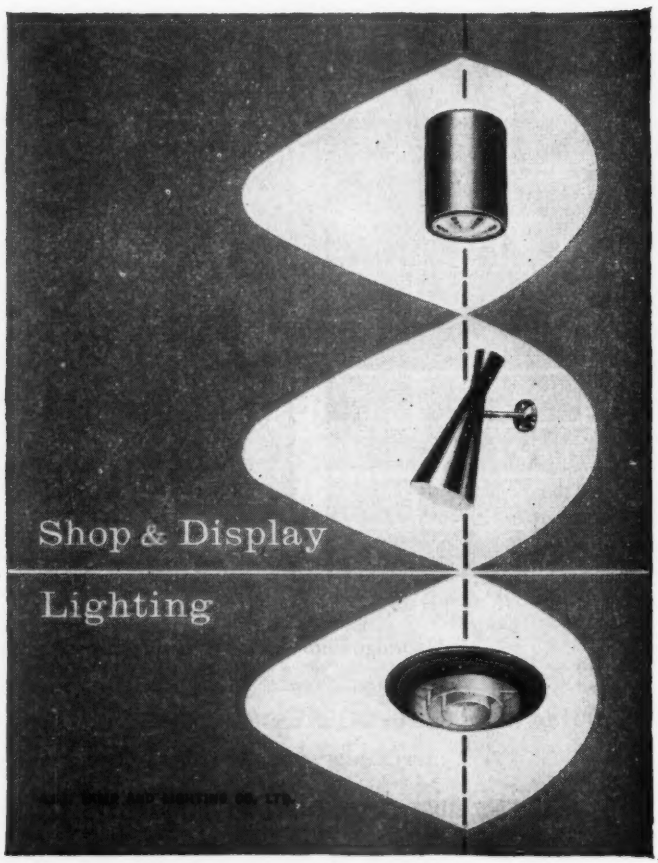
A.E.I. offer an extensive and flexible range of stocked equipment from which the designer can meet all normal demands of contemporary shop lighting. Prices are competitive.

This fully illustrated A.E.I. Shop and Display Lighting Catalogue gives complete details of the recessed, semi-recessed and surface mounted fittings, and the range of interchangeable glassware, skirts and louvers. Write for your copy now.









The illustrations on the left show a semi-recessed fitting, a new adjustable mounting for reflector spotlights and a louvered skirt for concealed mirror-glass reflectors.

Mazda *Lamps stay brighter longer*

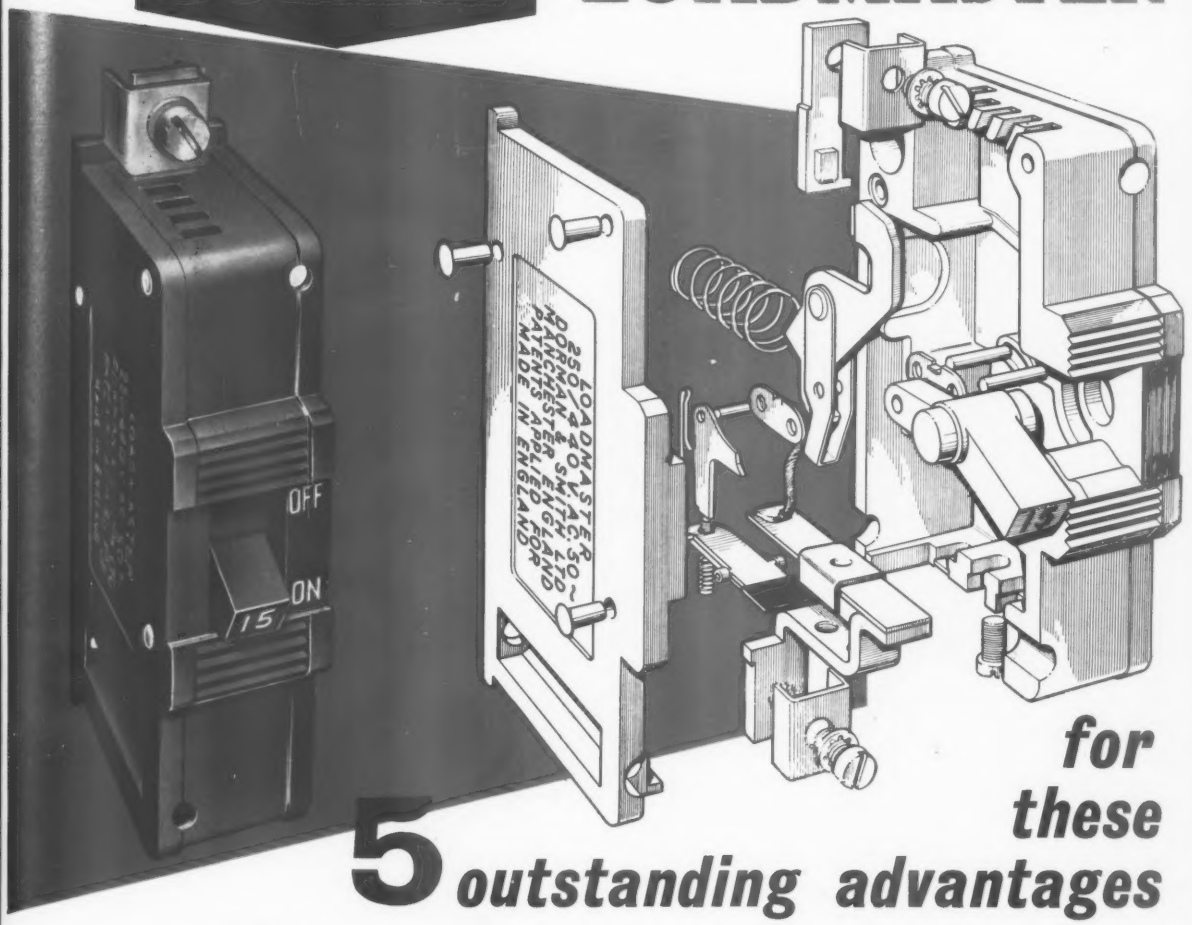
A.E.I. LAMP AND LIGHTING COMPANY LTD.

Publicity Department, 18 Bedford Square, London, W.C.1.

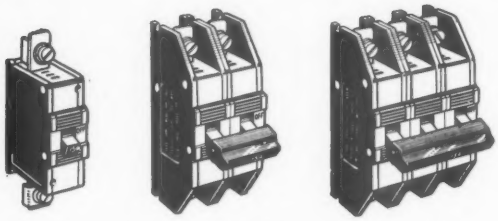
M-1731



DORMAN LOADMASTER



for these 5 outstanding advantages



- ★ Proved Performance—Both in test and service.
- ★ Lowest Price
- ★ Quick Delivery
- ★ Wide Range—Gives Extreme Adaptability
- ★ Domestic Units—For Home Installation

The high performance and efficiency ; extreme adaptability for many different applications, AND low initial and servicing costs of the LOADMASTER Circuit Breaker have been proved time and time again.

Furthermore, the loss of costly man-hours whilst fuses are replaced is entirely eliminated, quick identification of faulty circuits saves production hold-ups and full protection for power, heating, and lighting circuits are other features which commend LOADMASTER for practically every electrical installation.

Quick delivery of units and distribution boards.

Single Pole Units only 18/8 each, Double Pole Units 60/- each and Triple Pole Units 98/- each list.

Units available in ratings of 5, 10, 15, 30 and 50 amps. S.P. & N. Distribution Boards up to 16-way, T.P. & N. Boards up to 12-way.

ENTIRELY BRITISH design and manufacture

LOADMASTER Domestic Units are now available up to 10 ways. Fitted with 60 amp. D.P. slow-break incoming switch and either 2, 4, 6, 8 or 10 circuit breakers.



★ **Detach this page and keep it for reference.** / Overleaf are given some interesting technical details of the LOADMASTER.

LOADMASTER - FIT IT AND FORGET IT!

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LOADMASTER - FIT IT AND FORGET IT!

Some notes regarding the application of

LOADMASTER Circuit Breakers

GENERAL

The Loadmaster is essentially a final sub-circuit protective device. Extensive experience has shown that the " backing up " of Miniature Circuit Breakers (M.C.B.), *by* M.C.B., in a distribution network may give rise to loss of discrimination, and is therefore, generally inadvisable.

FAULT LEVEL

It should be appreciated that the " Useful " breaking capacity of an M.C.B. is approximately of the same order as a rewireable fuse. M.C.B. may safely be applied without " back up " protection in circuits having a fault level, at the point in the circuit at which they are to be installed, equal to or less than the relevant " Useful " breaking capacity.

Application of M.C.B., in any medium or large distribution network will however, usually result in there being a protective device backing up a group of M.C.B. Class " Q " H.R.C. Fuses rated between the limits shown in the following table are recommended for this purpose.

	S.P.		T.P.	
	0/30A	50A	0/30A	50A
Minimum Rating of Fuse	60A	100A	60A	100A
Maximum Rating of Fuse	150A	150A	100A	100A

DISCRIMINATION

A combination of H.R.C. Fuse and M.C.B. in a distribution network will ensure discrimination of M.C.B. against fuse up to the following approximate values of fault level :—

FUSE RATING	FAULT LEVEL
60 amp.	1,000 amp.
100 amp.	1,500 amp.
150 amp.	2,000 amp.

In designing an installation it is not always possible to ensure that the fault level at the M.C.B. installation point is lower than the appropriate level for satisfactory discrimination. It should be remembered, however, that fault level diminishes rapidly in a sub-circuit ; and it may under these circumstances be considered sufficient to ensure that the fault level in the portion of the circuit where the likelihood of a fault is greatest, is such as to provide satisfactory discrimination.

MOTOR CIRCUITS

Wide variations in the size and duration of motor starting surges make it generally impracticable to recommend LOADMASTER for the complete protection of the motor itself. They have, however, been successfully employed as a more convenient alternative to the isolator and fuses normally present in a motor circuit. Breakers should be rated in accordance with the accompanying table.

B.H.P. of Motor	SINGLE PHASE 230v. M.C.B. Rating	SINGLE PHASE 250v. M.C.B. Rating	THREE PHASE 400v. M.C.B. Rating	THREE PHASE 440v. M.C.B. Rating
⅛	5	5	5	5
¼	5	5	5	5
½	5	5	5	5
¾	10	10	5	5
1	10	10	5	5
1½	15	15	5	5
2	30	30	5	5
3	30	30	10	10
4	50	30	10	10
5	50	50	15	15
6			15	15
7			30	30
7½			30	30
10			30	30
12½			50	50
15			50	50
20			50	50

FREE *Send today for your copy of the latest* **DORMAN MINIATURE CIRCUIT BREAKER CATALOGUE**

DORMAN & SMITH LTD.

PRESTON: Atherton W'ks, Blackpool Rd., Preston, Lancs.
Tel: PREston 86785 (6 lines)

LONDON: 125 High Holborn, W.C.1.
Tel: CHAncery 6431

BIRMINGHAM: 2/3 Graham Street, Birmingham 1
Tel: CENtral 2009

GLASGOW: 249 St. Vincent Street, Glasgow, C.2
Tel: CENtral 2479

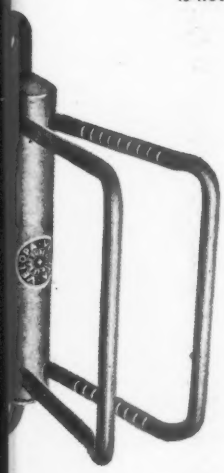
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rmission of Harlow Development Corporation, Essex

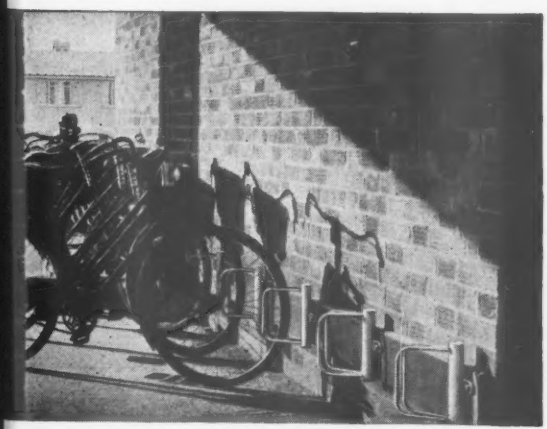
the versatile VelopA

solves all bicycle parking and storage problems
is made from heavy section steel tubing and bar
is hot dip galvanised after manufacture
requires no maintenance
is virtually indestructible
has no moving parts
grips tyre only
has symmetry,
simplicity
and style

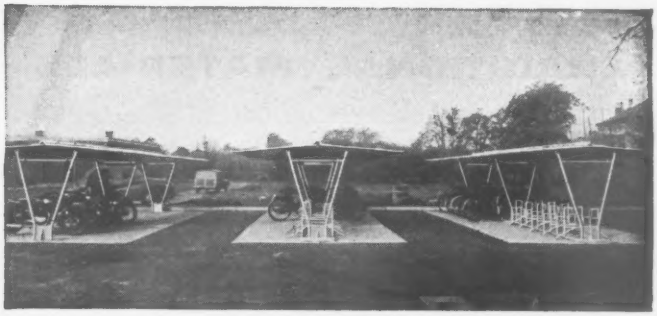


VelopA
bicycle
holders

LE BAS TUBE COMPANY LIMITED
City Wall House, 129 Finsbury Pavement, London, E.C.2
Telephone: MONarch 8822 Telegrams: Lebasco, Avenue, London
LONDON . MANCHESTER . GLASGOW . BELFAST



rmission of The Chief Education Officer, County Borough of Ipswich, Suffolk



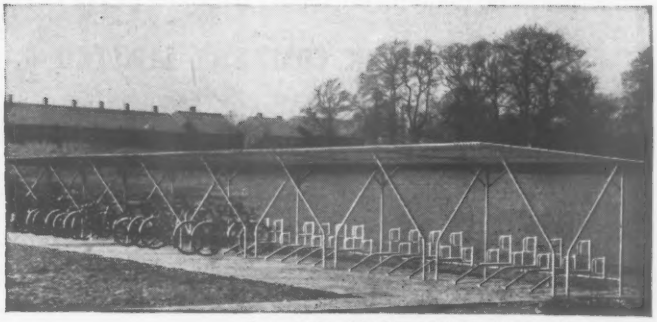
By permission of The Chief Education Officer, Norfolk Education Committee



By permission of The Chief Architect, Crawley Development Corporation, Sussex



By permission of L. G. Vincent, Chief Architect, Stevenage Development Corporation, Herts

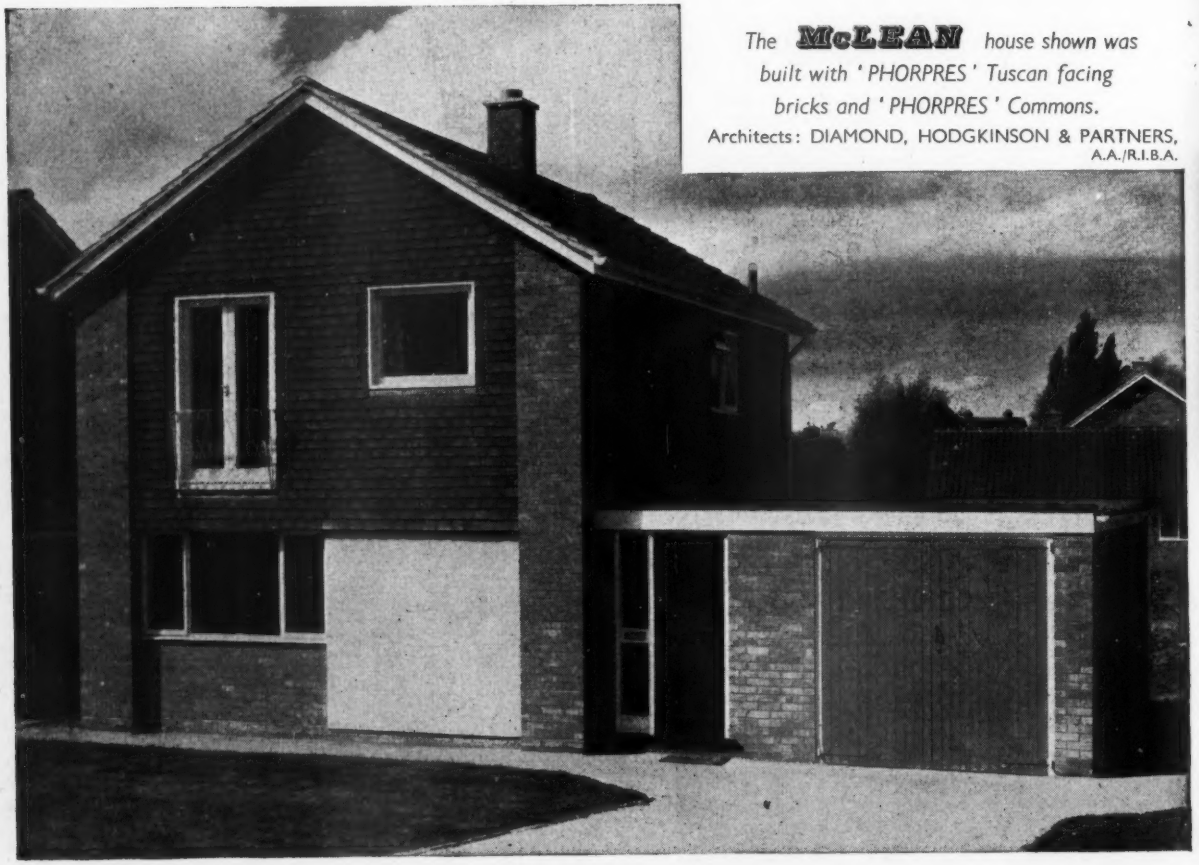


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TRADITIONAL MATERIALS * CONTEMPORARY DESIGN

Brick is the most suitable material for building in this country, giving great scope for design and allowing contemporary ideas to be economically expressed. Brickwork is also the most competitively priced walling material. It requires no maintenance, mellows attractively with the years, and is in keeping with the traditional English scene. London Brick Company Limited offers the architect an ever-widening range of attractive facing bricks giving a wide variation in colour and texture at prices designed to reduce the cost of municipal and private building projects.

Please write asking for our fully illustrated Sales catalogue.



The **McLEAN** *house shown was built with 'PHORPRES' Tuscan facing bricks and 'PHORPRES' Commons.*
Architects: DIAMOND, HODGKINSON & PARTNERS, A.A./R.I.B.A.

LONDON BRICK COMPANY LIMITED in the service of the building industry

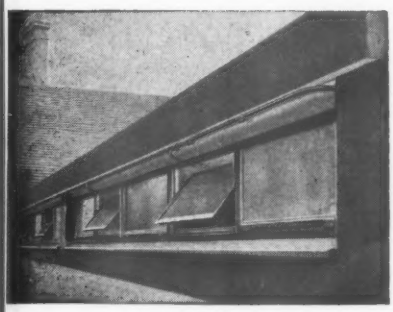
PHORPRES

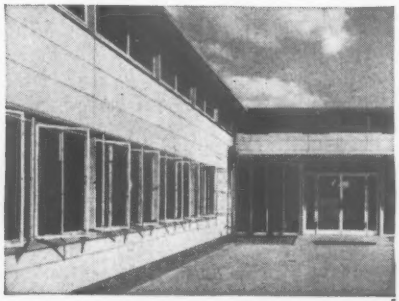
Head Office: Africa House, Kingsway, London, W.C.2. Telephone: Holborn 8282
Midland District Office: Prudential Buildings, St. Philip's Place, Birmingham 3. Telephone: Central 4141
South-Western District Office: 11 Orchard Street, Bristol 1. Telephone: Bristol 23004/5
Northern District Office: St. Paul's House, 20-22 St. Paul's Street, Leeds. Telephone: Leeds 20771

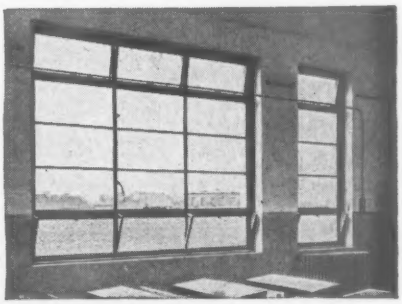
BY APPOINTMENT TO HER MAJESTY QUEEN ELIZABETH II BRICK MAKERS

Neat...efficient...unobtrusive...

ARENS WINDOW CONTROLS

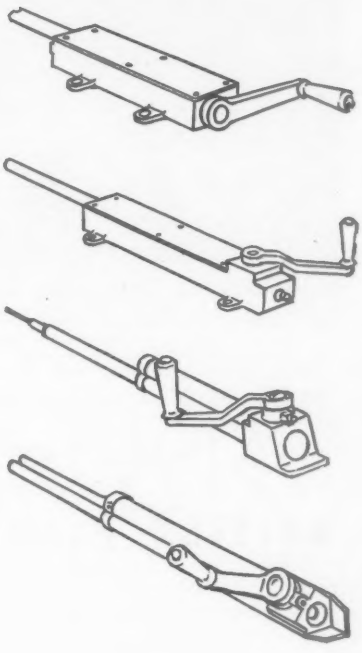






Today's functional, 'unfussy' architecture calls for neat and unobtrusive window controls. Fit ARENS remote controls, the result of more than 26 years of specialisation in one study. Made for light or heavy duty, for single or multiple operation, ARENS Window Controls are simple and efficient in design and can either be run beneath the plaster or painted to match the walls.

Write for prices and details of all models to our Contracts Department



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Tunstall Road, East Croydon, Surrey

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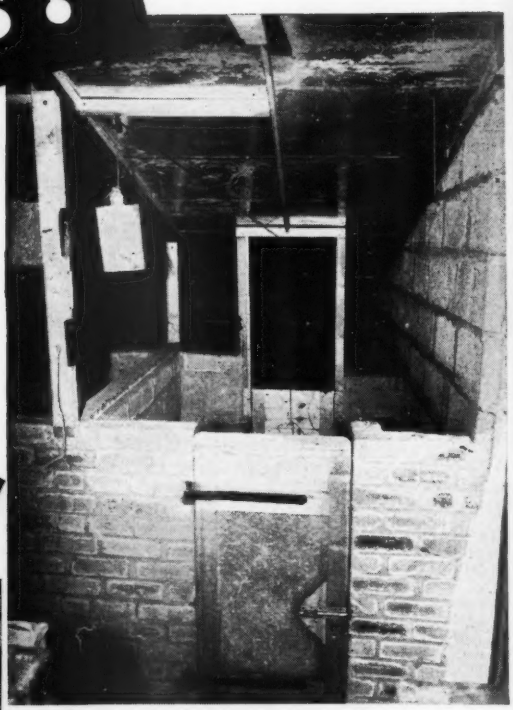
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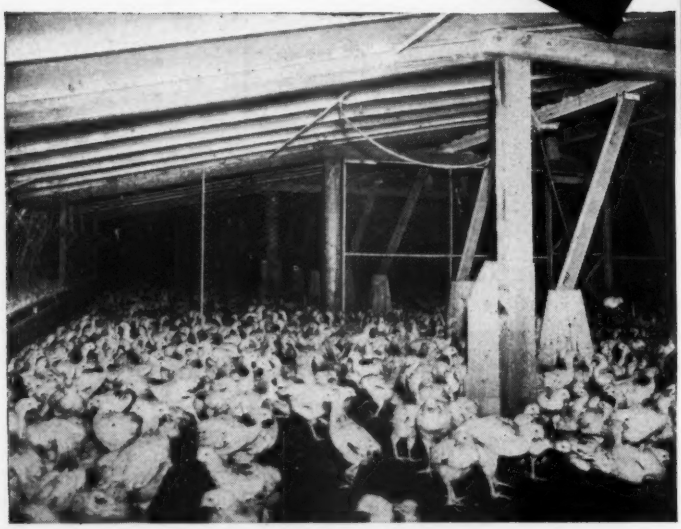
BLUE HAWK PRODUCTS

pigs?

poultry?



'Paramount' Insulating Plasterboard employed to line roof of a piggery.



Chickens kept warm, dry, and healthy by using 'Paramount' Insulating Plasterboard.

Photographs by courtesy of the "Farmer & Stock-Breeder" and "Poultry World".

Yes, British Plasterboard plays an important part in insulating Farm Buildings, too.

Here are some typical comments by users:—

"Having tried various materials, I found 'Paramount' Insulating Plasterboard suited my purposes best".

"There is no doubt in my mind that 'Paramount' aluminium foil-lined Plasterboard is by far the cheapest form of providing the inside lining of any insulation scheme".

"In farm buildings 'Paramount' Insulating Plasterboard forms a real and permanent barrier against moisture".

"I have used 300,000 sq. ft. of 'Paramount' Plasterboard and have never known it to fail to stand up to requirements".

"By using an asbestos roof lined with 'Paramount' Insulating Plasterboard, I have virtually eliminated the risk of fire".

"Under conditions of high condensation, 'Paramount' Water-Resisting Plasterboard is ideal".

Obtain full particulars of 'Paramount' Insulating and 'Paramount' Water-Resisting Plasterboard today from

FARM BUILDING DIVISION

THE

BRITISH PLASTER BOARD

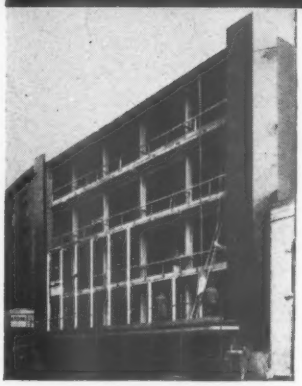
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AP 121

MURAGARD CURTAIN WALL TWO-HOUR FIRE GRADING

8 DAYS from START to FINISH



MARCH 18th, 1958
Erection commences.

The erection of this Muragard Curtain Wall, covering an area of just under 3,000 sq. ft. at the new Broad Plain premises of Gardiner of Bristol, architect, A. E. Powell, Esq., A.R.I.B.A., took only eight working days from start to finish. Note the complete absence of scaffolding, erection is effected from inside the building. *For future planning and speed of erection specify Muragard, the Curtain Wall with the TWO-HOUR fire grading.*

(Patents applied for in the United Kingdom and overseas)

FIRE RESISTING
TWO-HOUR FIRE GRADING

DECORATIVE TREATMENT
Glazing and spandrel infillings to the architect's choice.

DIMENSIONS
— in accordance with the International Module of 4″ as expounded in the Transactions of the Modular Society.

SUPPLIED AS A 'PACKAGED' ARTICLE

SPEED OF ERECTION

WRITE NOW FOR FULLY ILLUSTRATED BROCHURE — designed especially for your own filing system.

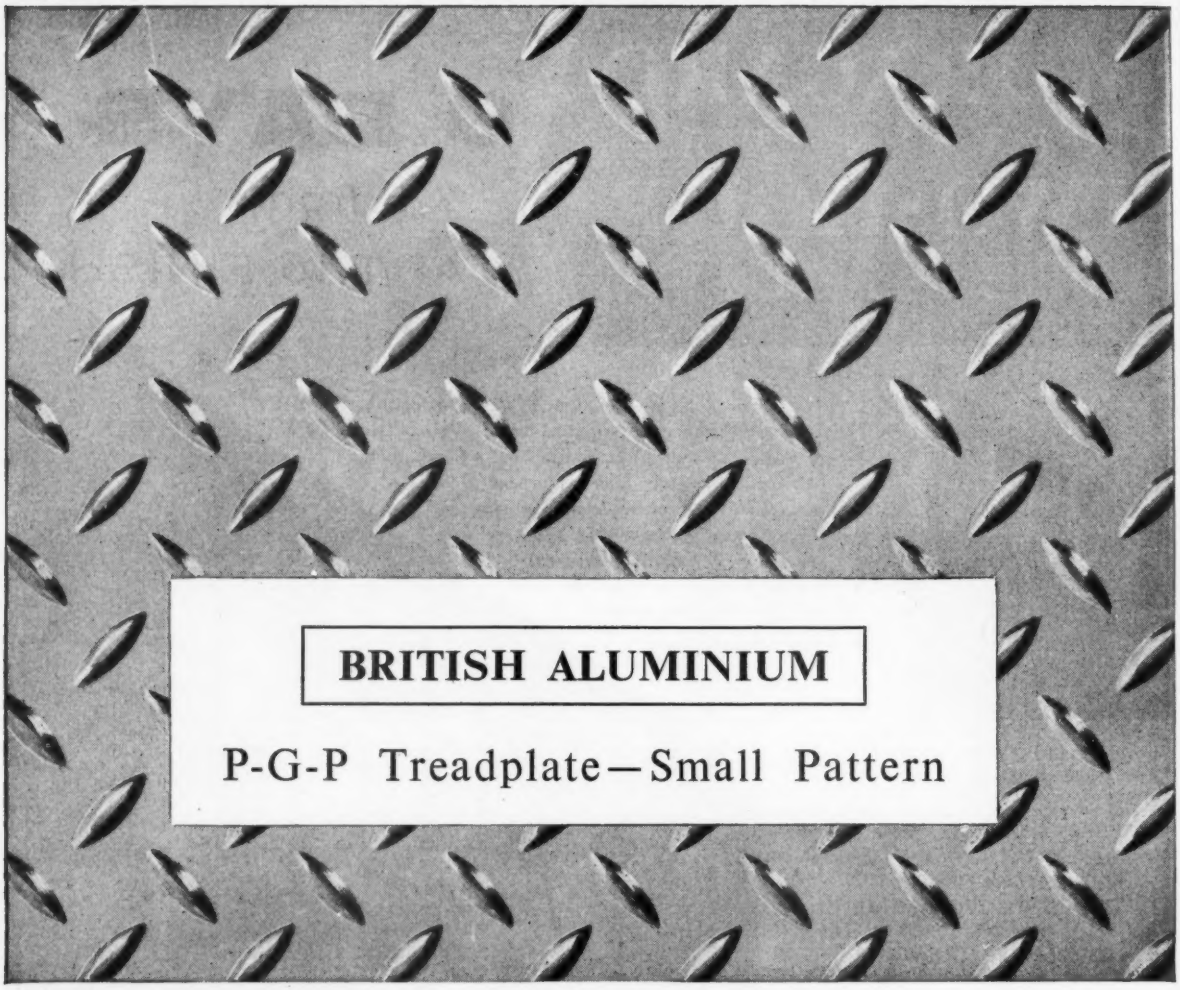


MARCH 27th, 1958. The completed Curtain Wall.

GARDINER

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M-W.136





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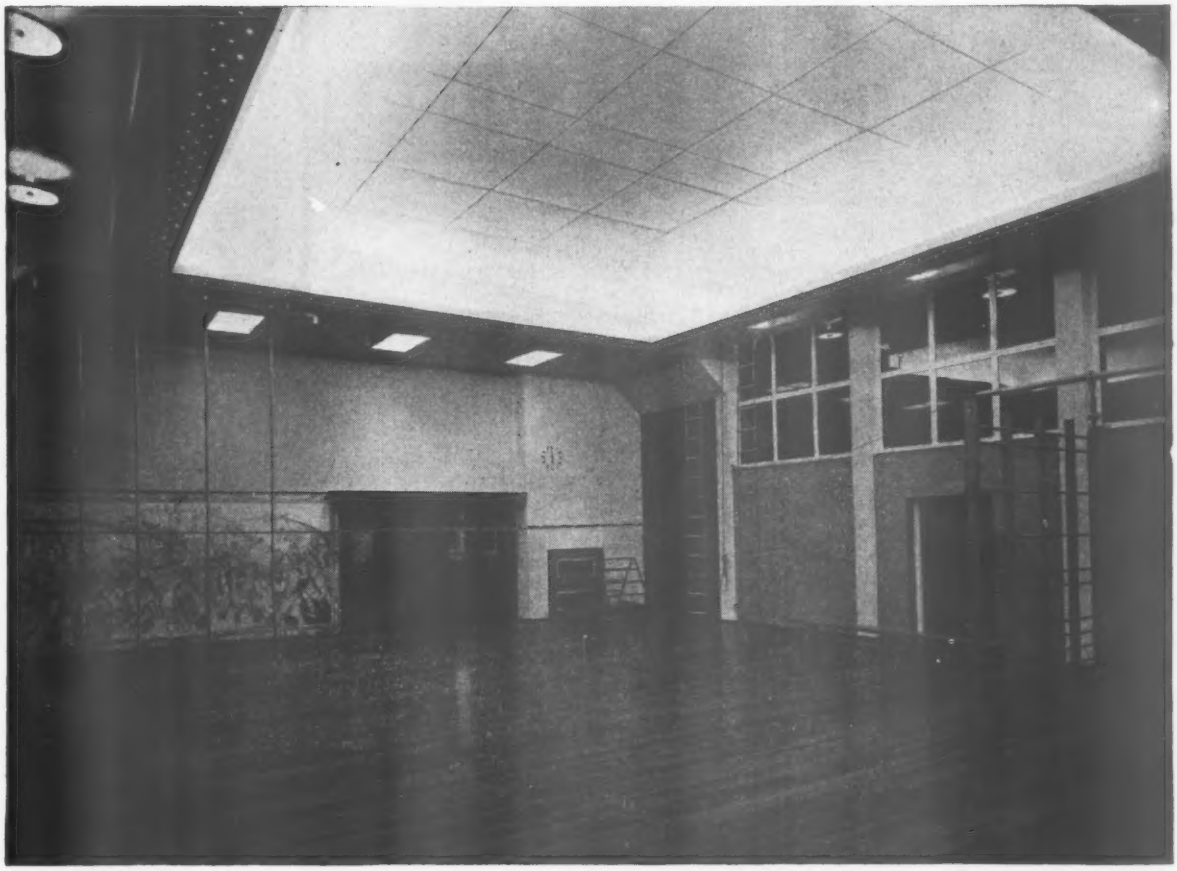
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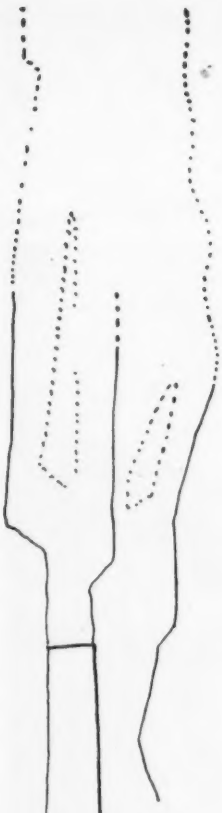
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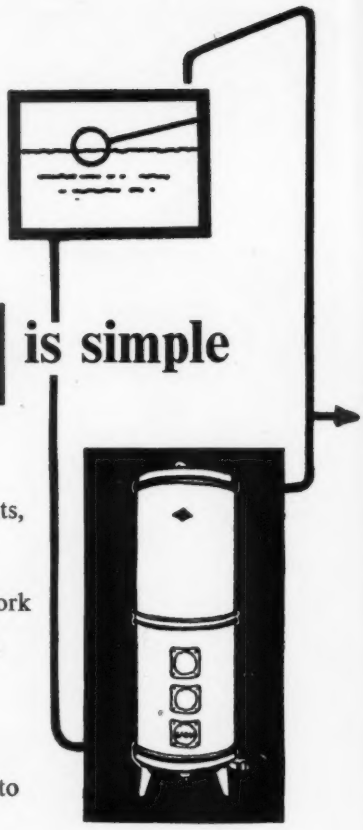
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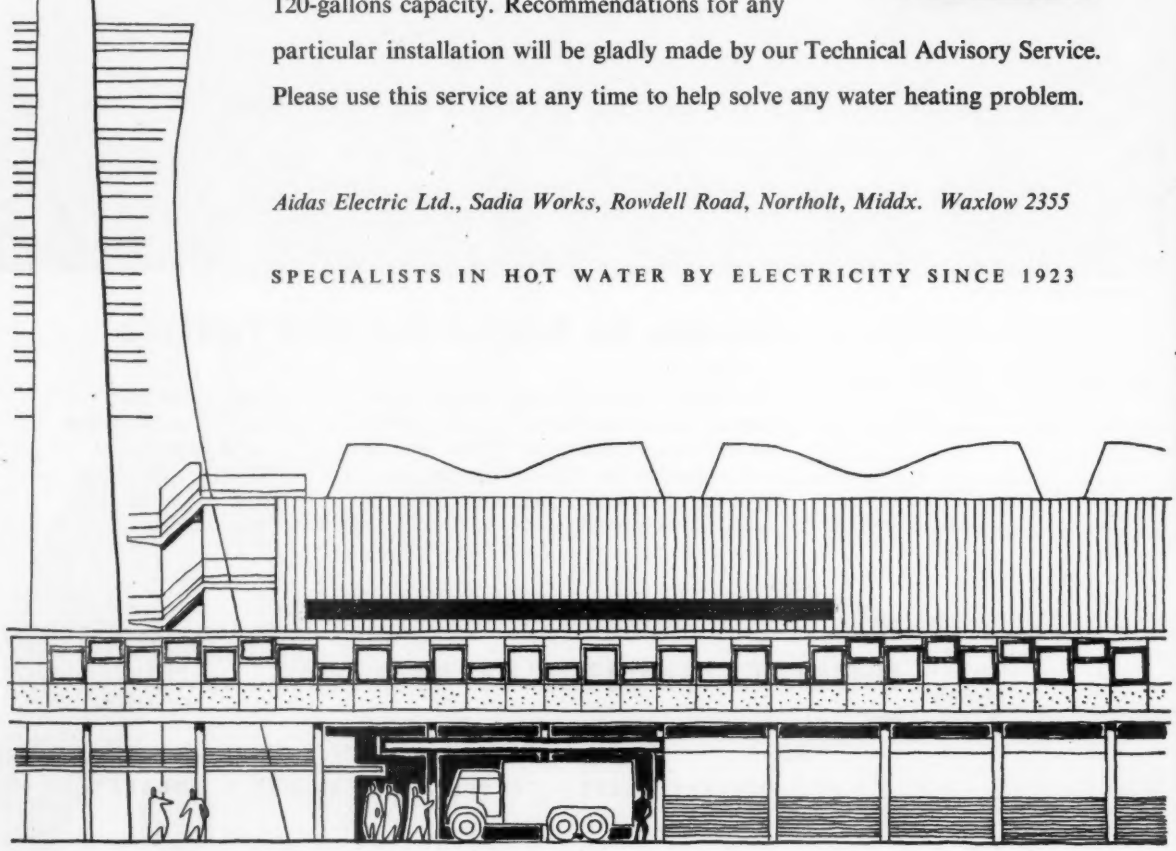
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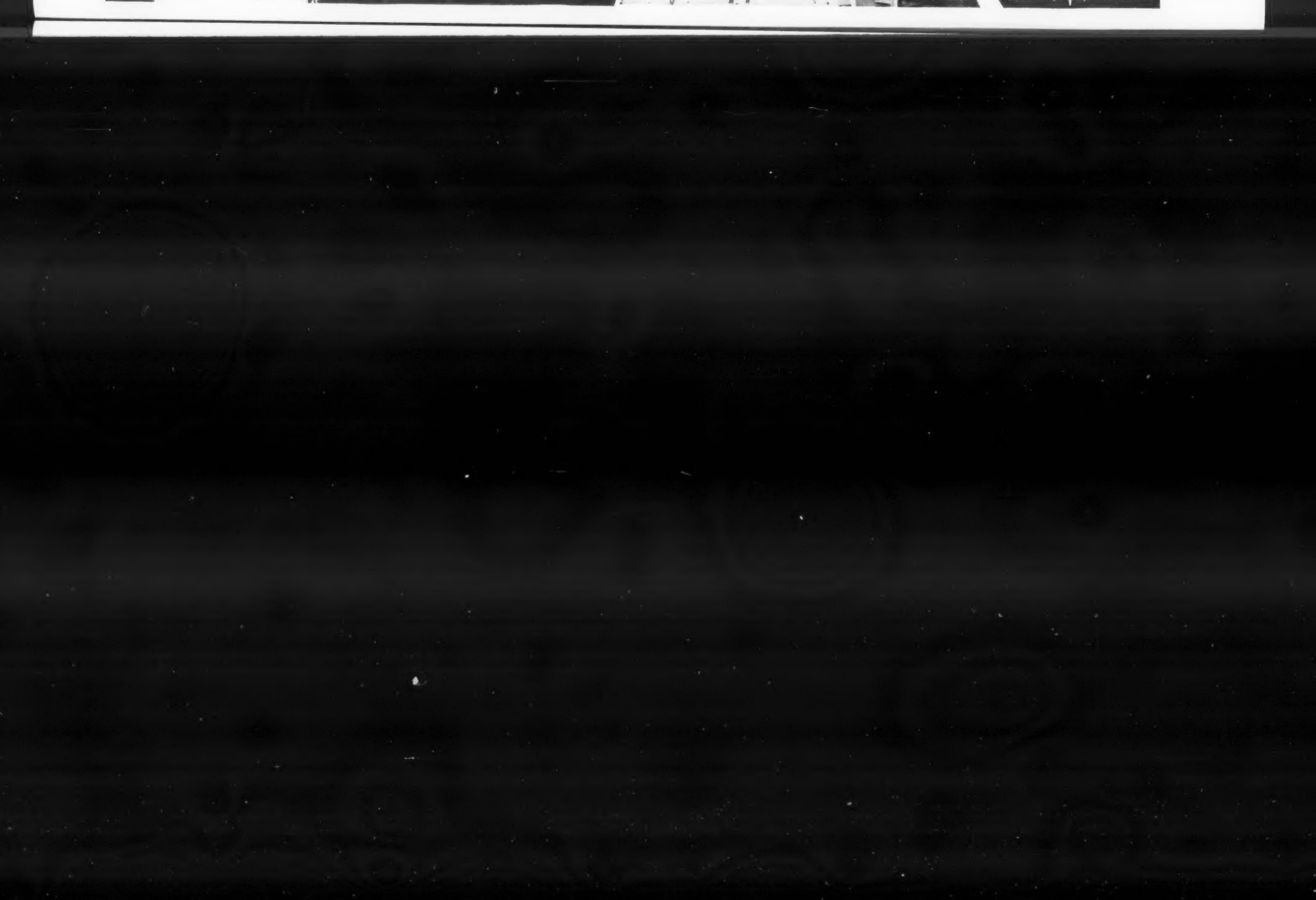
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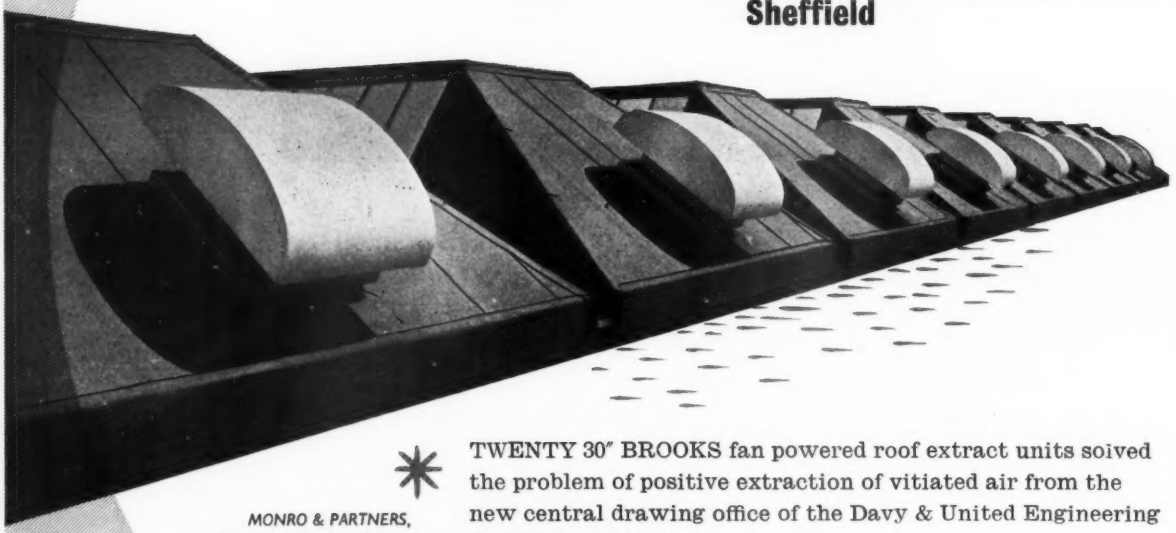
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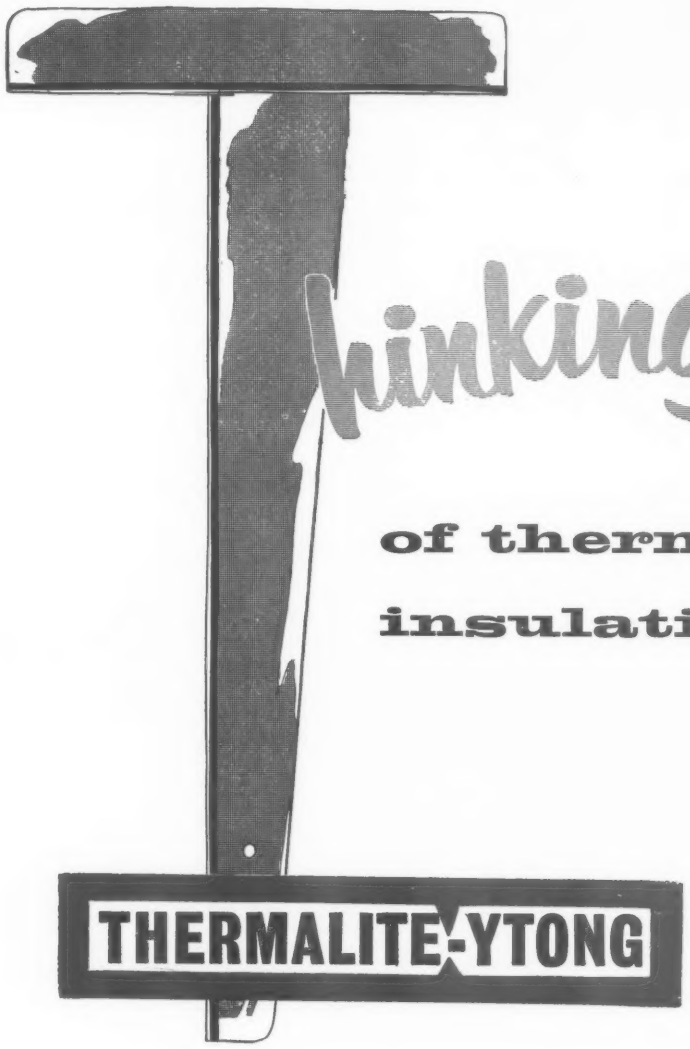
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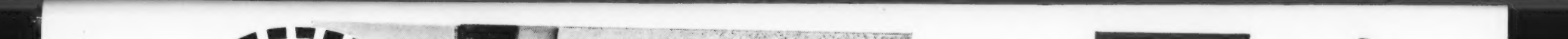
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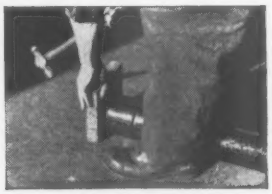
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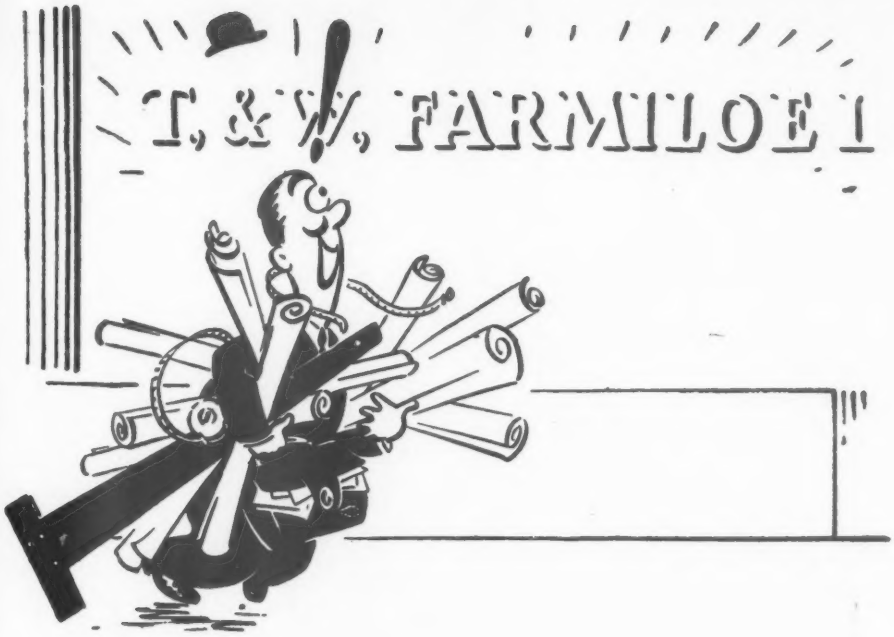


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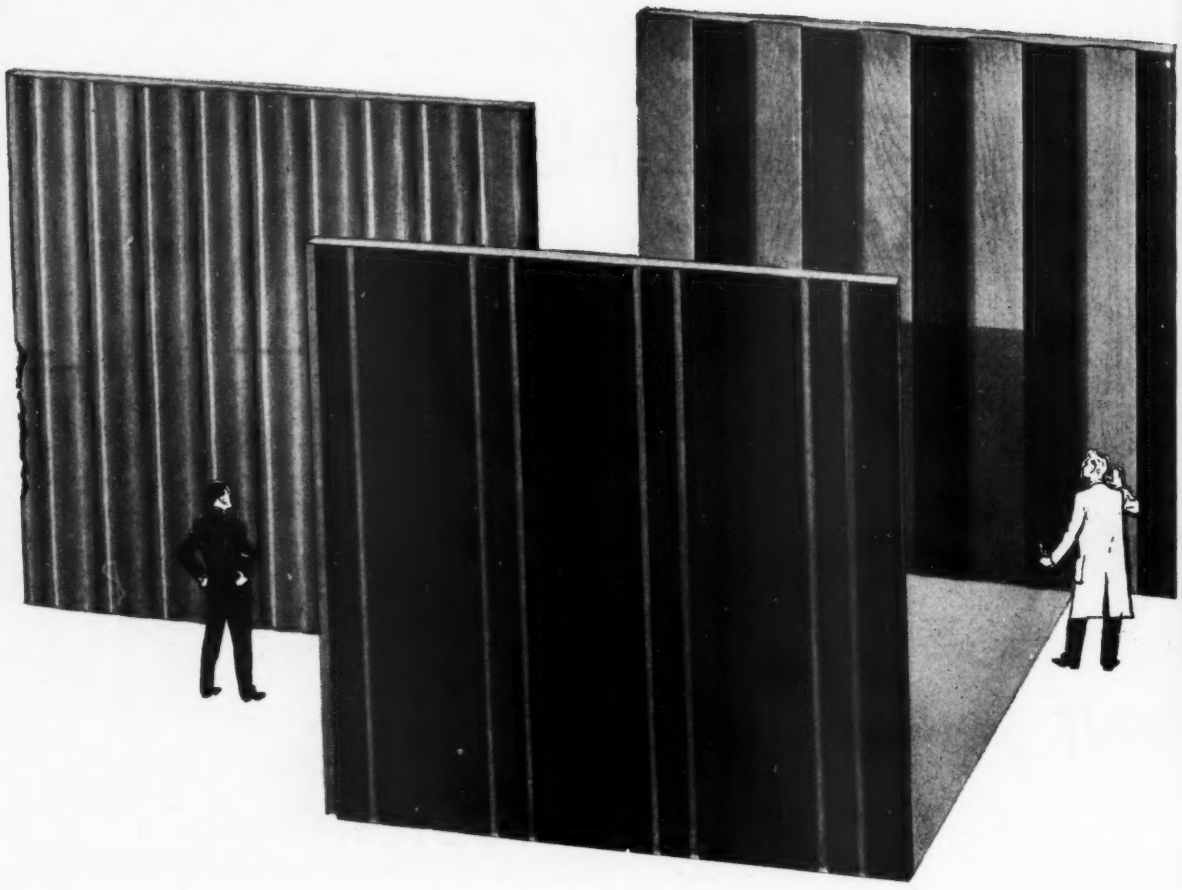
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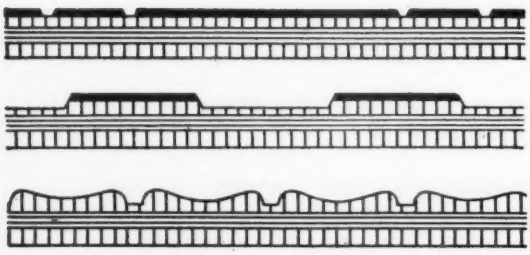
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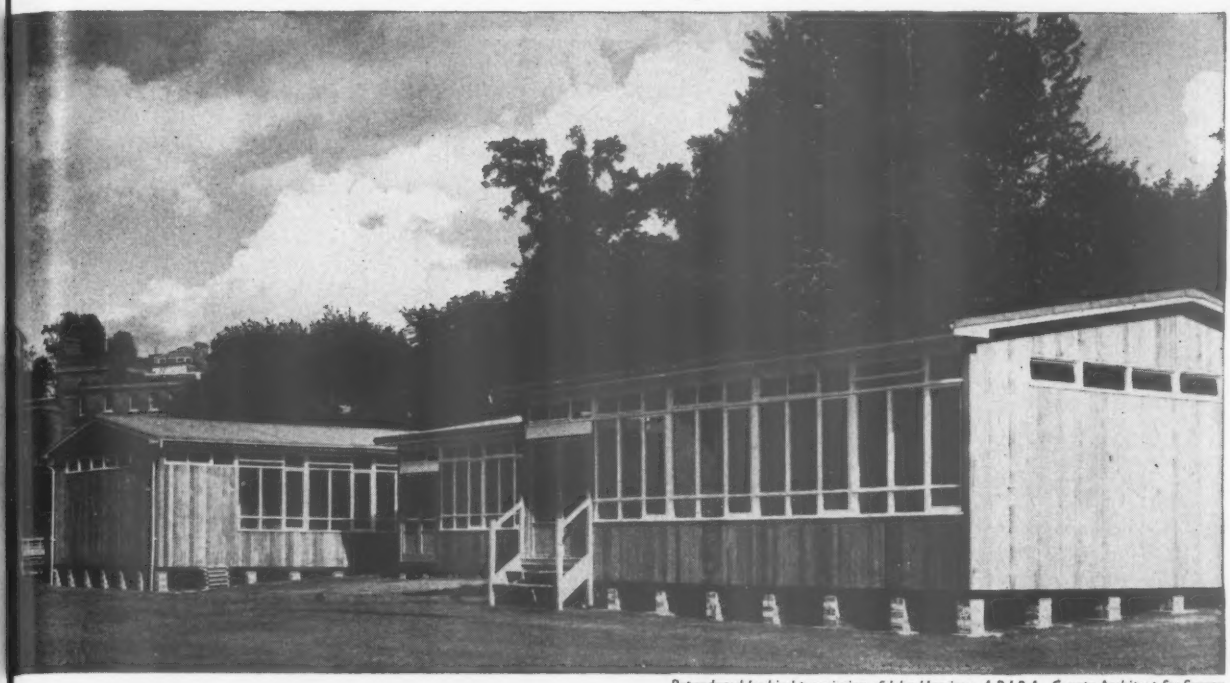
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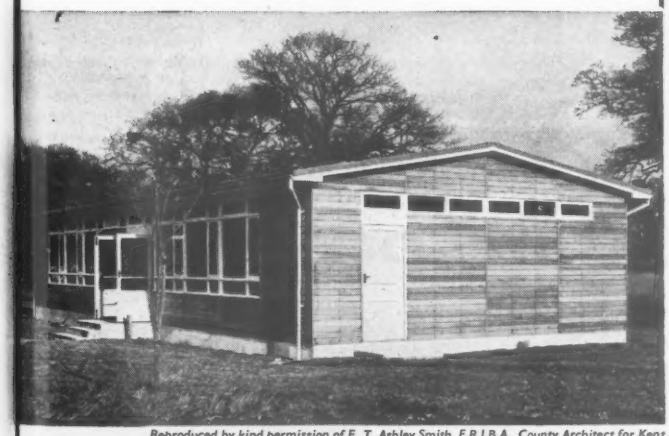
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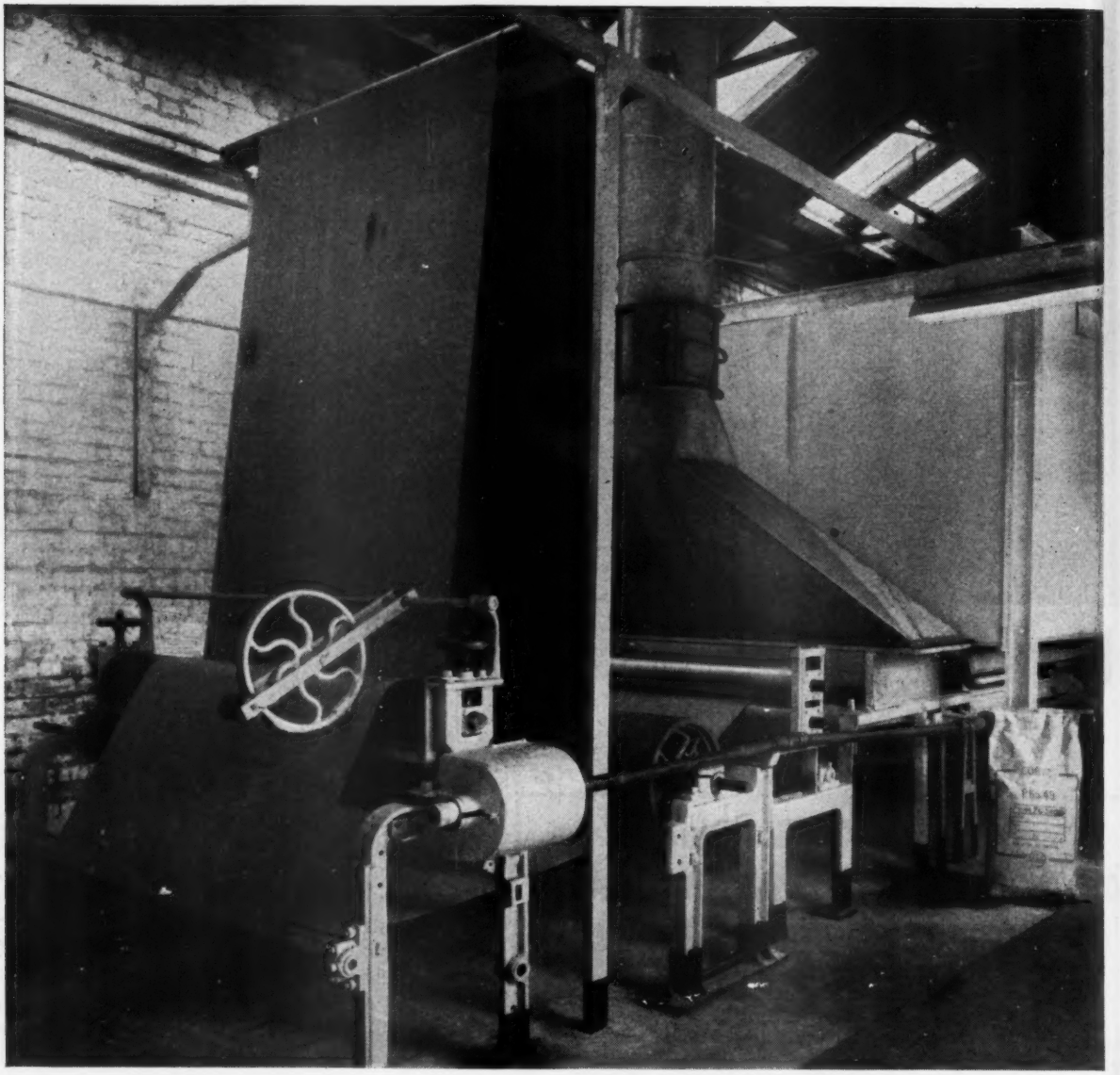
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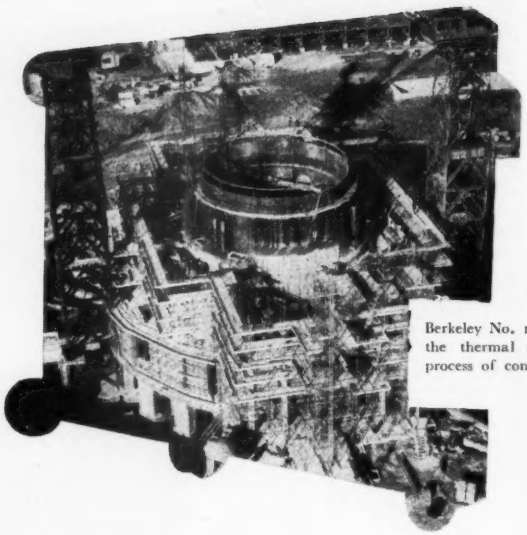
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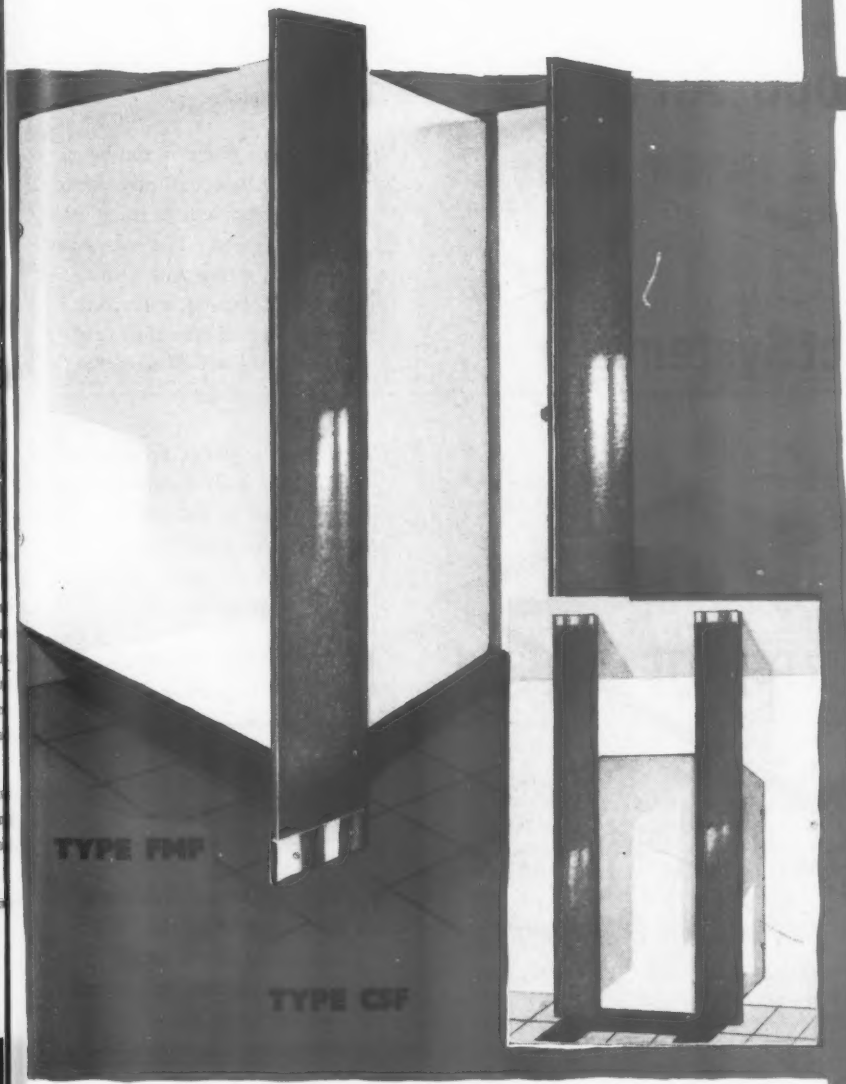
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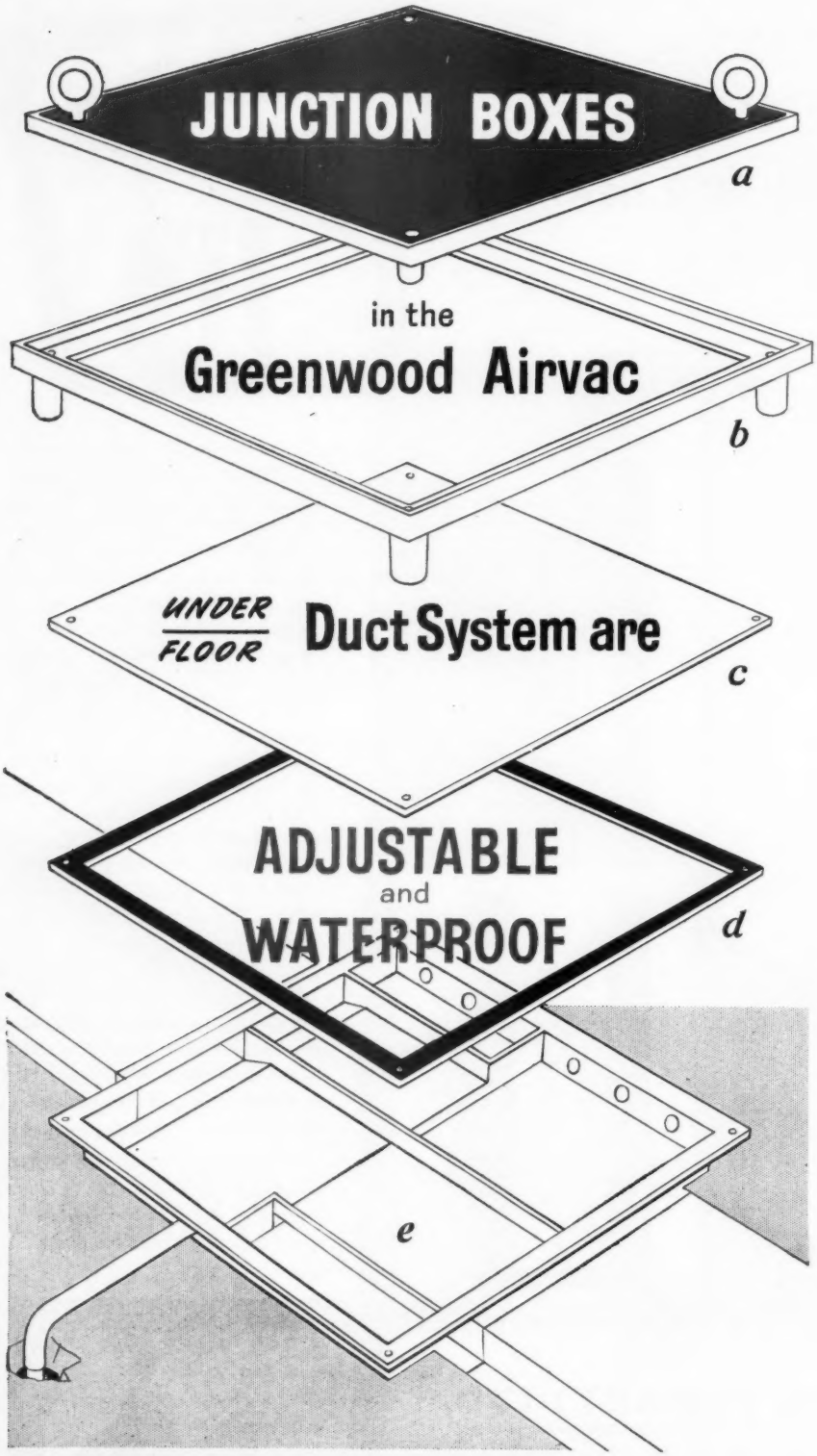
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The *brass frame* (*b*) can be adjusted independently before *and after* screeding, using the keys supplied. The *brass floor tray* (*a*), shown with lifting bolts in position, will accept any depth of floor thickness from 3/16″ to 7/8″ terrazzo or wood blocks.

The *cover* and *gasket* (*c* and *d*) ensure a really watertight box which can be laid in 1½″ screed. And, of course, *crossovers* (*e*) enable cables to be segregated.

The Junction Box is just one feature of Greenwood Airvac underfloor Conduits.

Purpose-made to accommodate ducts from 4″ x 1″ upwards.

Write for further details and information about the Greenwood Airvac underfloor and skirting duct systems —or call to see the demonstration layouts.

Greenwood Airvac Conduits Ltd

Patentees, Designers and Manufacturers of Electrical Conduit Systems

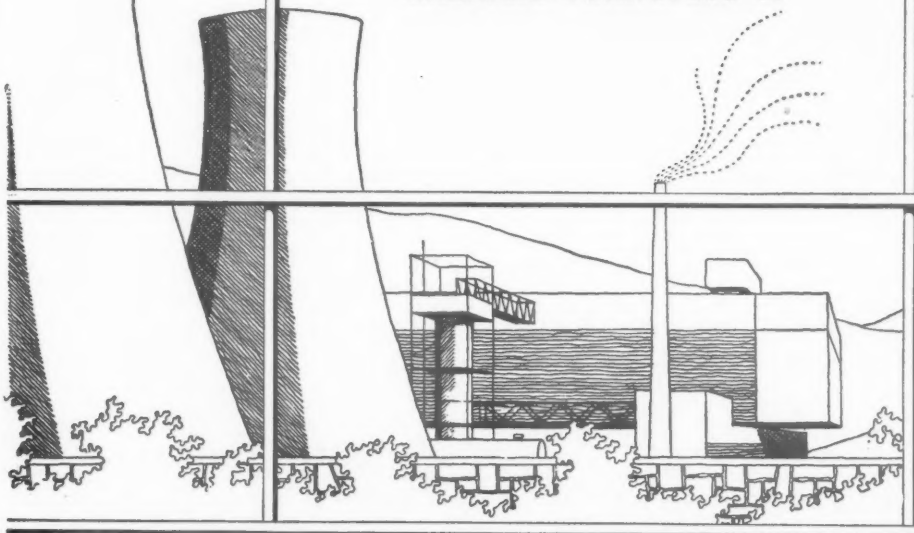
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Architects:
S. N. Cooke & Partners F. F.R.I.B.A.

Main Contractors:
William Towson & Sons Ltd., Bolton.

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The reinforcement fabric used in the Metal Box Company factory at Bolton was supplied by Richard Hill. Do you need reinforcements? Then call up the Maxweld man! He can give you all the facts on the type and quantity of fabric you'll need plus a rough idea of the cost. And he's backed by the

Richard Hill Design Service

who can then draw up more detailed plans and estimates. You can get him at Middlesbrough (2206), London (Mayfair 3538), Birmingham (Mid. 5625), Manchester (Central 1652), Leeds (2-7540), Bristol (24977), Glasgow (Central 2179), Nottingham (Bulwell 27-8383), Bournemouth (Westbourne 63491),

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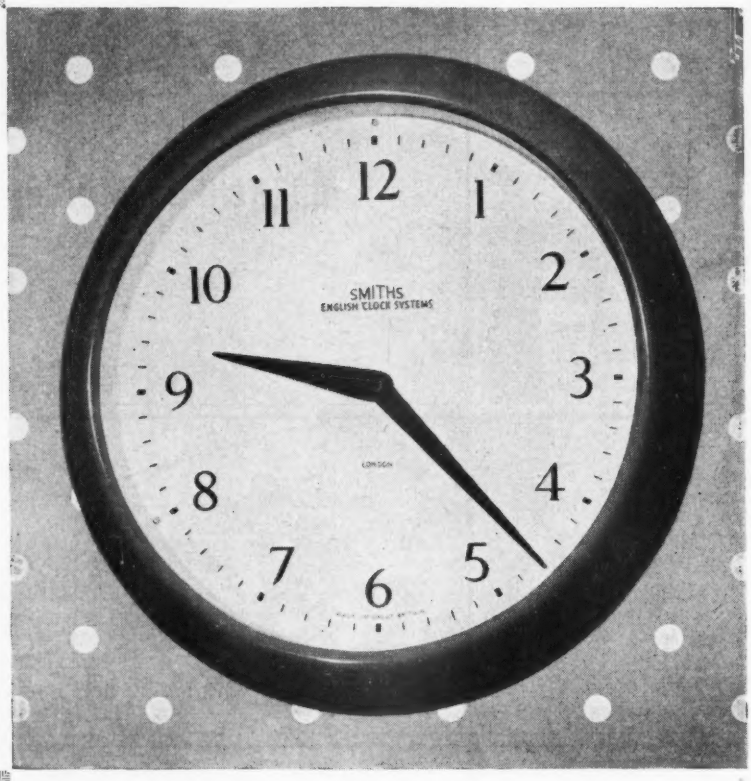
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Bush House, Birmingham.

Photograph by courtesy of the "Birmingham Post"

Architects:
Harry W. Weedon, F.R.I.B.A. & Partners
in co-operation with
A. G. Sheppard Fidler, M.A., F.R.I.B.A., A.M.T.P.I.,
City Architect.

Building & Civil Engineering Contractors:
C. Bryant & Sons Ltd., Birmingham.

Gypunit Partitions installed by
Gyproc Products' Contracts Department.



GYPROC AT BIRMINGHAM

provided an attractive means of dividing space whilst permitting flexibility for the future in the office layout at Bush House

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GYPUNIT Partitions are easily and speedily erected, light in weight, demountable and adaptable to individual requirements. The surface spread of flame classification is Class 1 (B.S.476). For extra quietness there is a Double-leaf GYPUNIT Partition giving high sound reduction. GYPUNIT Partitions are described fully in "Architects' Journal" Information Sheet A21G2. Copies available on request.

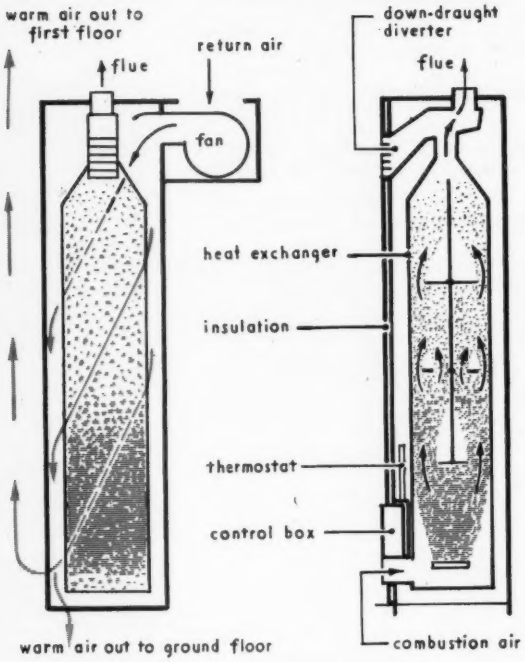
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S/GU6

DUCTED WARM AIR

Gives a higher comfort standard than any other heating system



These are the main advantages of ducted warm air heating:—

Speed of response—adjustment of the room thermostat produces the required temperature faster than is possible by any other system (e.g. to raise a room of 1500 cu. ft. first thing in the morning from the night background temperature of 55°F to a "breakfast-time" 60°F takes only 20 minutes, where insulation is to the Egerton standard.) As soon as the thermostat calls, the full rated output of the unit is made available.

Flexibility—because of the speed of response, fuel economy can be effected by turning down the thermostat when rooms are not being used for a while, knowing that the temperature can be restored quickly when required. (This is very valuable in such places as schools where heating is required only at specific times.) For further economy whole rooms can be "turned off" by simply closing the outlet grilles.

Uniformity of temperature distribution. By using *low level* discharge and high level return, very low temperature gradients can be achieved. This avoids that "cold feet and hot head" feeling characteristic of some older systems.

Freedom of planning—by heating the *whole* building *all* the enclosed space becomes useful space. Ducts are easily accommodated at early planning stages and, being concealed, they make no demands on wall space. The outlet and return grilles are unobtrusive. Whether you use open plan or the older styles, ducted warm air makes planning easier and offers tempting scope for new ideas.

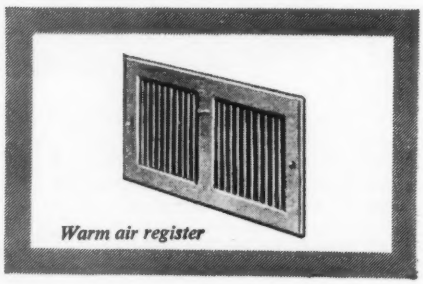
Clean heating—since the warm air is "moved" into the room—instead of merely rising from an outlet—there is no discoloration of the walls like the stains seen above radiators. (The warm air has, of course, no contact at any point with the flue gases.)

Ventilation—the circulation of warm air through a building is stimulating to the occupants and does away with the "heavy" feeling associated with the earlier forms of central heating.

Clothes drying—really efficient drying cupboards can be incorporated simply and cheaply into a ducted installation. This is of particular value in multi-storey flats.

Drying out. A practical advantage of a warm air system is the ease with which it can be used to speed the drying out of new buildings for early occupation.

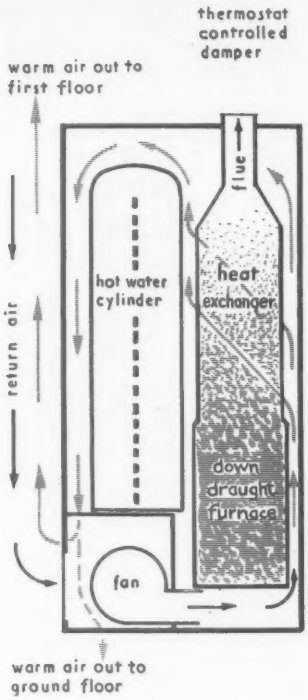
DUCTED WARM AIR *systems offer all these advantages and, where required, hot water can be produced merely by utilising the heat of the appliance "when idling". There is clearly a strong case for warm air heating as such—but which particular system? We believe that* Radiation Ductair *is best able to answer your needs.*



Warm air register

the best
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system is called

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Here are the reasons why:—

Running costs—Radiation equipment is developed with an almost fanatic concern for running costs which Radiation engineers take to be the true efficiency index of an appliance. Here is a short example—many others, in detail, may be seen on request.

Bungalow at Oulton Broad, Suffolk. 1500 sq. ft. insulated to Egerton standard. Heating by Ductair 0.50. Average oil consumption over 2 years (heating period 1 Oct. to 31 March) . . . 625 gallons domestic fuel oil. Standard of heating attained: Living room 60°F, Bedrooms 55-60°F (day and night averages.) N.B. plus *domestic hot water during heating season. Out of season hot water by immersion heater.*

Installation costs—the Ductair system is cheaper than, for example, a fully thermostatically controlled radiator system using comparable fuel. Detailed comparisons are available.

Precision construction—tailored to the particular requirements of each contract, all Ductair is of the highest workmanship. This is essential in producing units of accurately predictable performance to give years of trouble-free service.

Nationwide network of Radiation-trained stockists. To speed design and on-site work, Radiation have established more than 40 fully trained area stockists to provide real "head office" attention near your site. This speeds work and can effect considerable savings. Regional design specialists can be called in by any stockist to meet new or unusual problems. Radiation offers a full after-sales service for Ductair equipment.

10 years' working experience in Britain. After a detailed examination of the best American practice in this field and research—which includes the building of experimental houses—Radiation developed the Ductair system, using low-level discharge, to meet the particular requirements of all types of buildings, for over ten years. This gives Radiation unrivalled experience *under the actual climatic and living conditions peculiar to this country.*

50 year background of research and experiment. Pioneers of smoke reduction, Radiation technicians, for well over 50 years, have been concerned with making better use of fuel. This is reflected in the simplicity of the highly efficient equipment they have evolved. It means too that Radiation engineers have an unusual ability to see their own system against a background of many alternative systems. You will find this understanding particularly valuable at discussion stage.

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The Curious Affair at Curio Corner

AUBREY CABRIOLE-QUINT loves everything that is old. Old houses—for he has restored Curio Corner (still known in the village as 'the old Rectory') to a more-than-Georgian splendour. Old furniture—for it brings him a more-than-modest income. And old-fashioned business methods—for he drives a ferocious bargain, and always deals in cash.

These amiable characteristics brought him to the notice of "Jelly" Jones, the celebrated safe-breaker. For he too loves old things—untraceable bank-notes and all small and portable valuables. So he paid a visit (after dark) to Curio Corner.

No burglar was ever more disappointed. In the cluttered showroom, looking quite at home between a Jacobean armoire and a Regency rent table, stood a very new Chubb safe. "Jelly" Jones crept softly away.

"Not much harm done," said Cabriole-Quint to the police complacently next morning. "I long ago learned that there is nothing so worthless as an antique safe. Now excuse me —I must get some of the latest Chubb window catches."

Antique security fittings are useless, but the well-run architect's office has a Chubb catalogue from which to specify the more specialised products of our art. If you haven't a copy please write or telephone to
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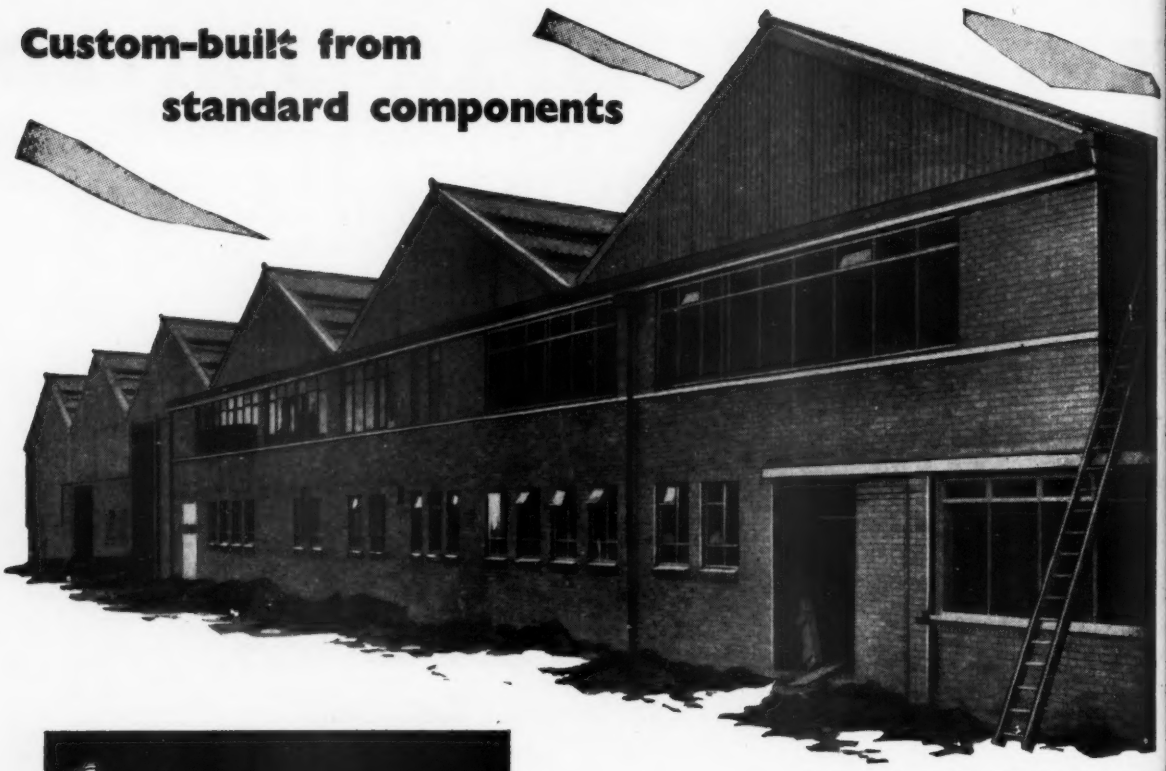
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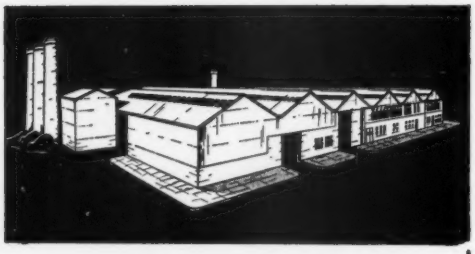
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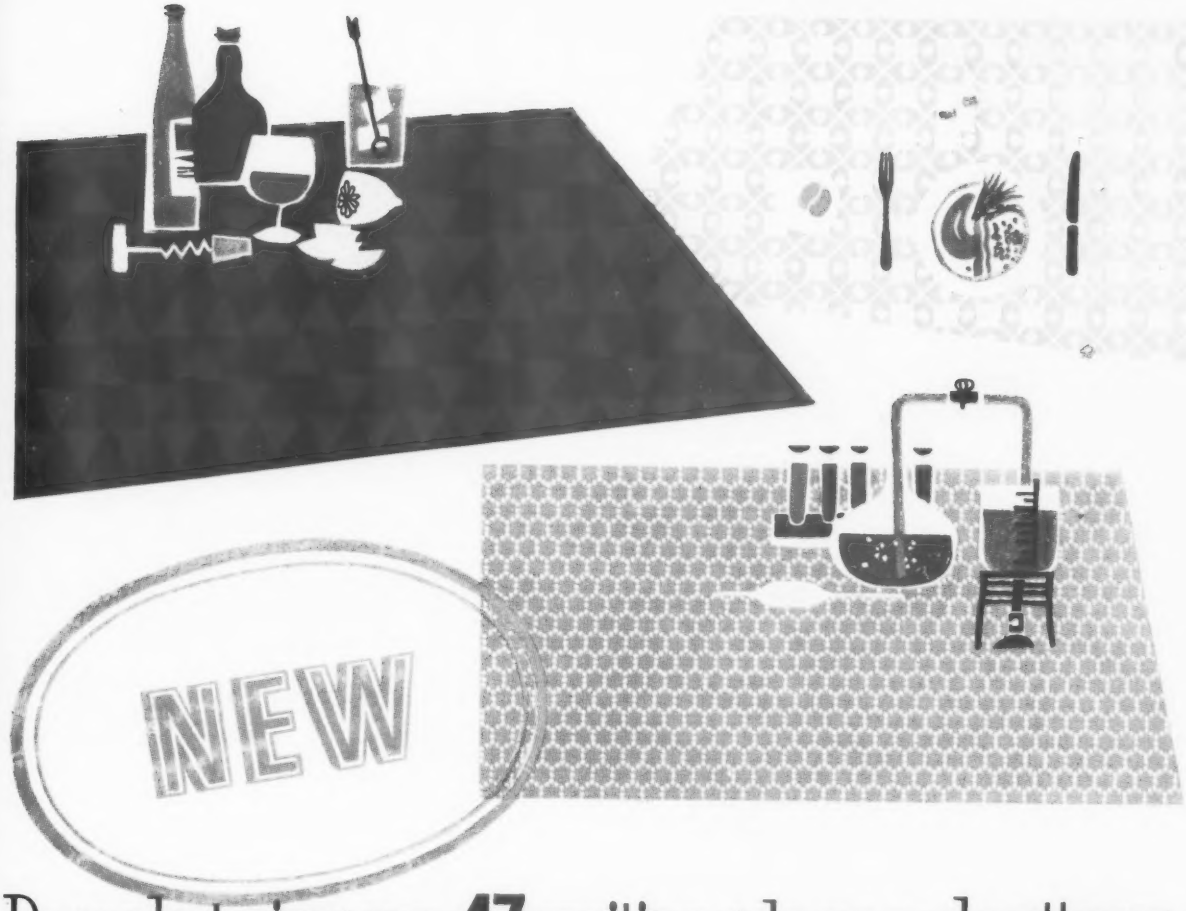
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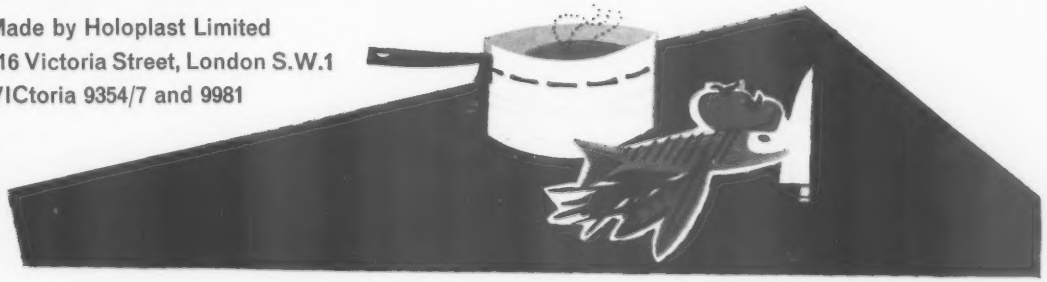
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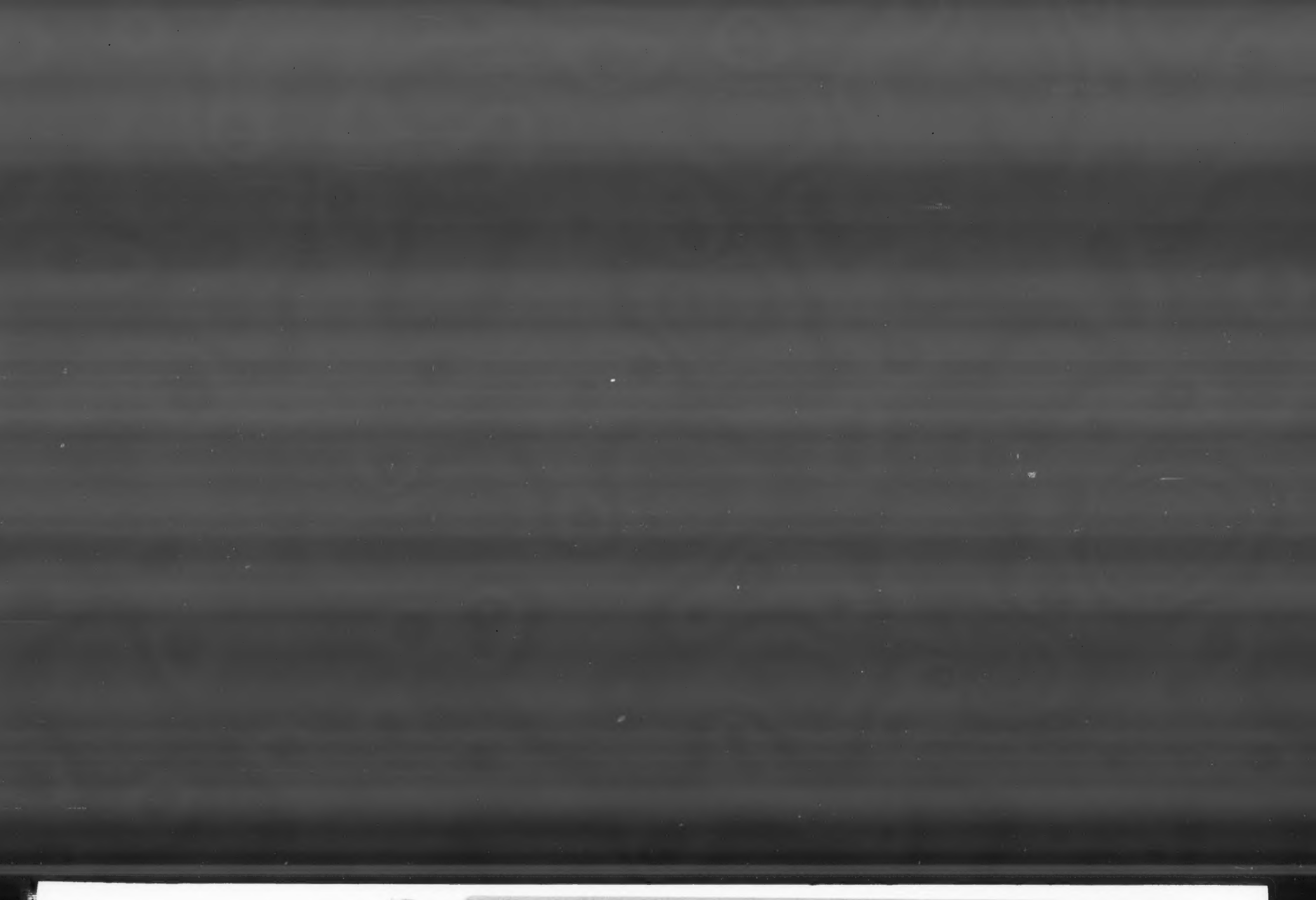
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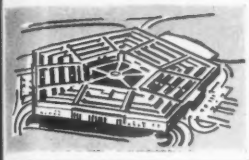




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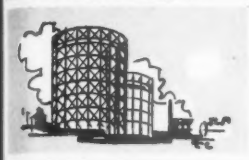
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The Pentagon, Washington, U.S.A., is the largest in the world. Completed in 1943, it cost about £29,660,000. The perimeter is about $\frac{7}{8}$th mile. Each side being 921ft. long. The floor area covers $6\frac{1}{2}$ million square feet. 28,500 people work in the building, there are 44,000 telephones, 220 telephone staff handling 280,000 calls a day. The telephone system is connected by 160,000 miles of wire.



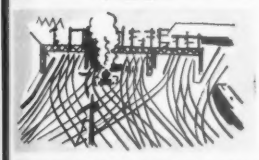
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The largest gas works in the world is Beckton Plant of the North Thames Gas Works in London. Covers 300 acres, employs 3,500 people, contains over 70 miles standard gauge railway line with 50 locomotives and 1,100 wagons. The coal handling plant can deal with 2,000 tons of coal per hour. The gas making capacity is 164,000,000 cubic feet per day from about 6,000 tons of coal.



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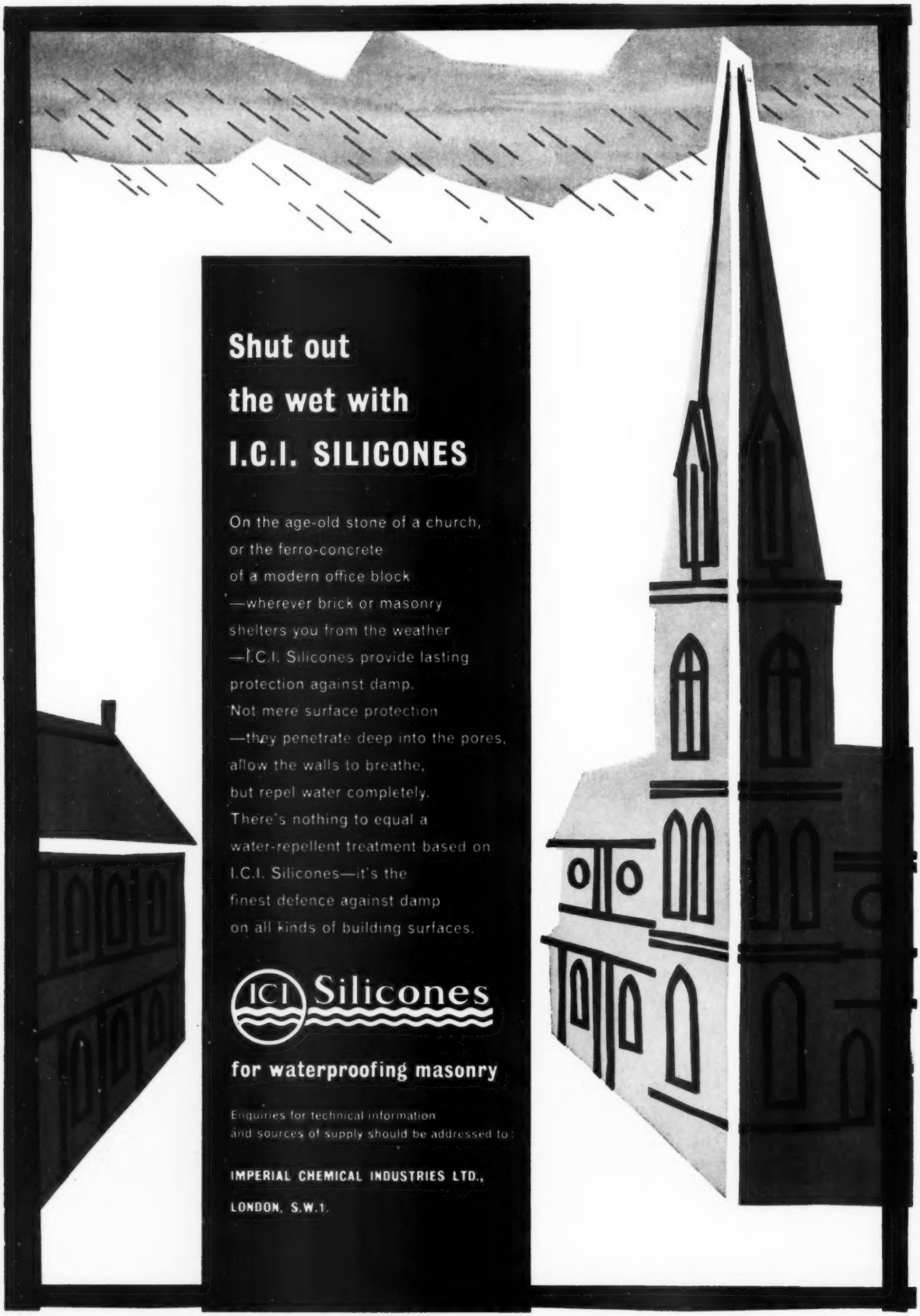
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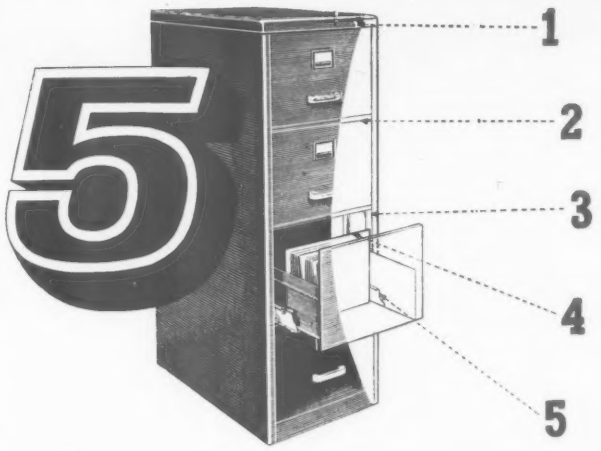
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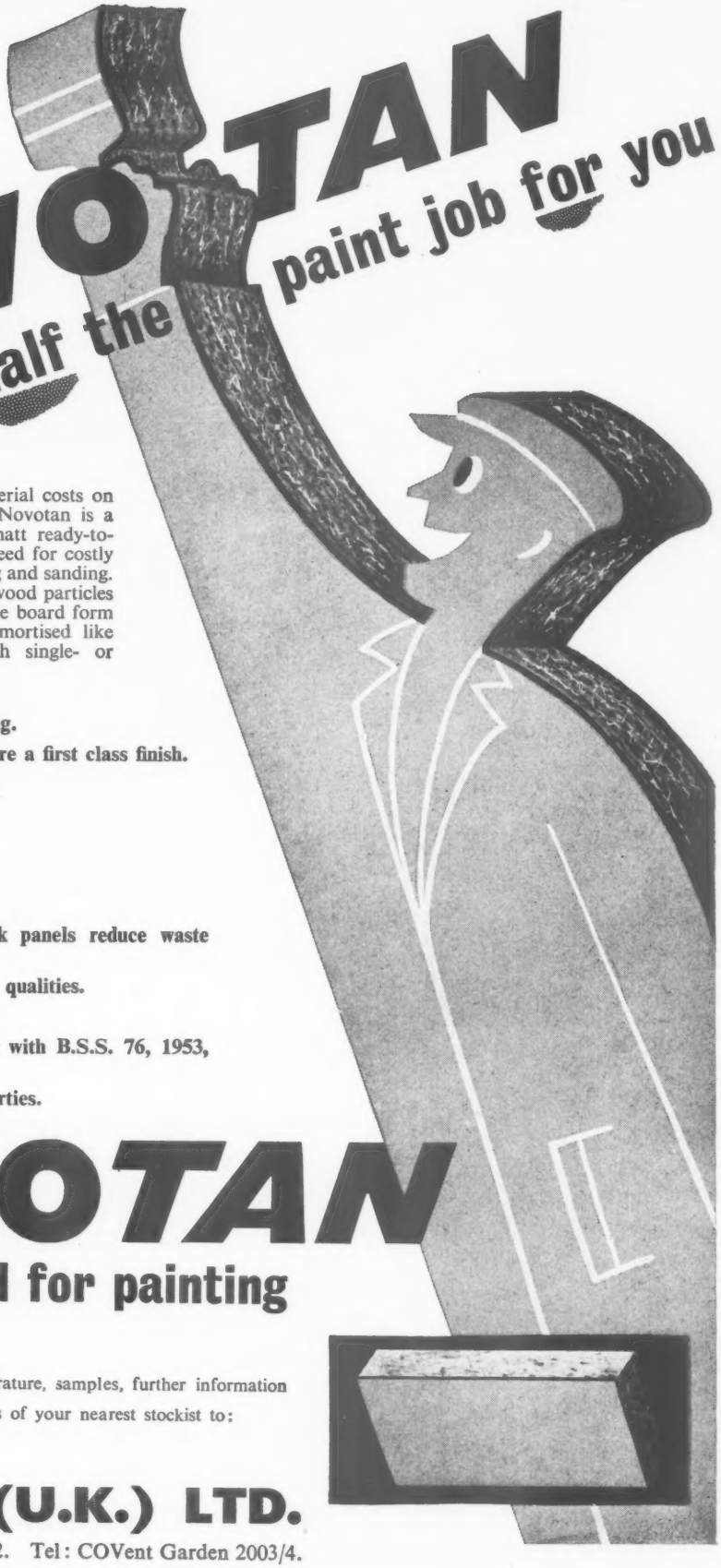
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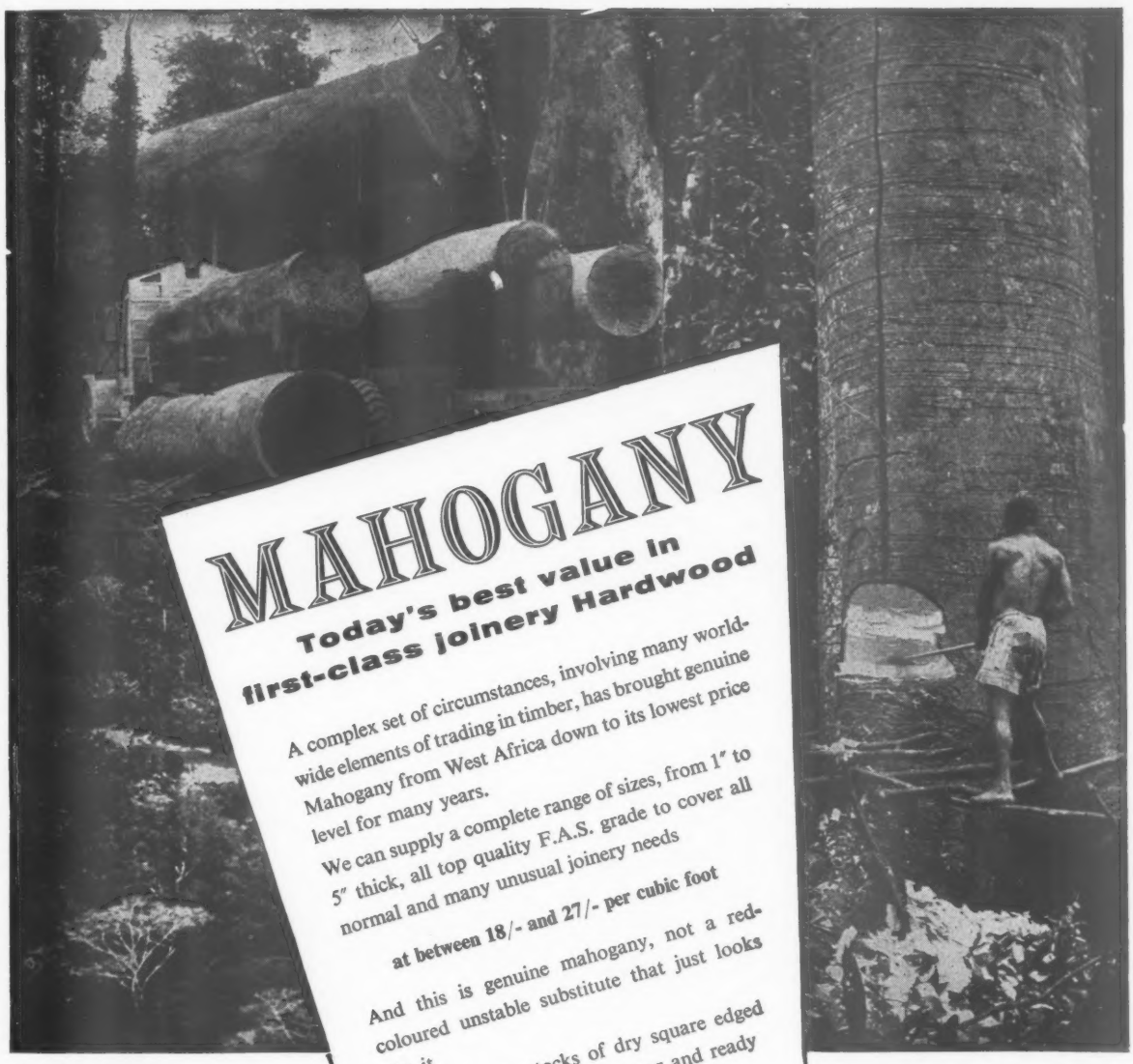
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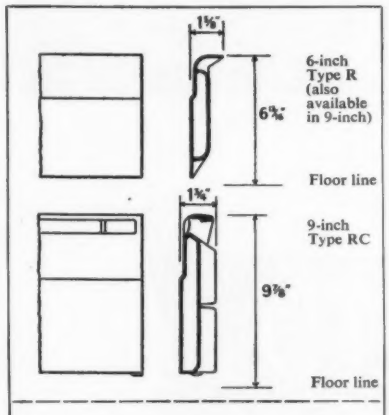
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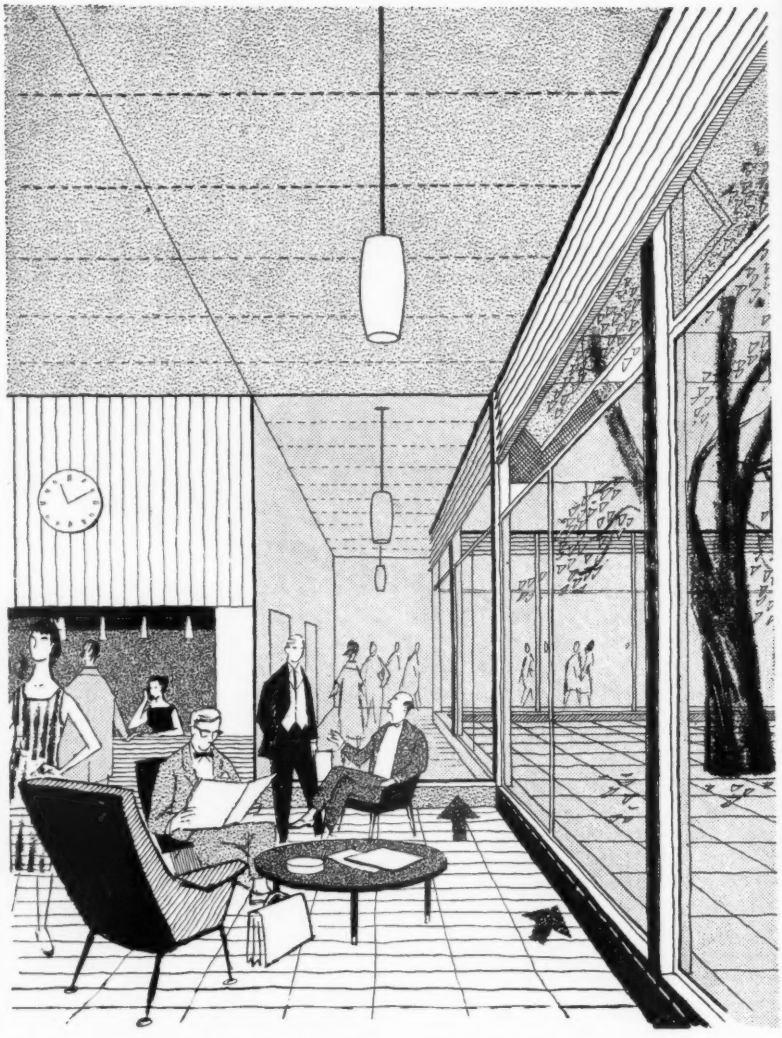
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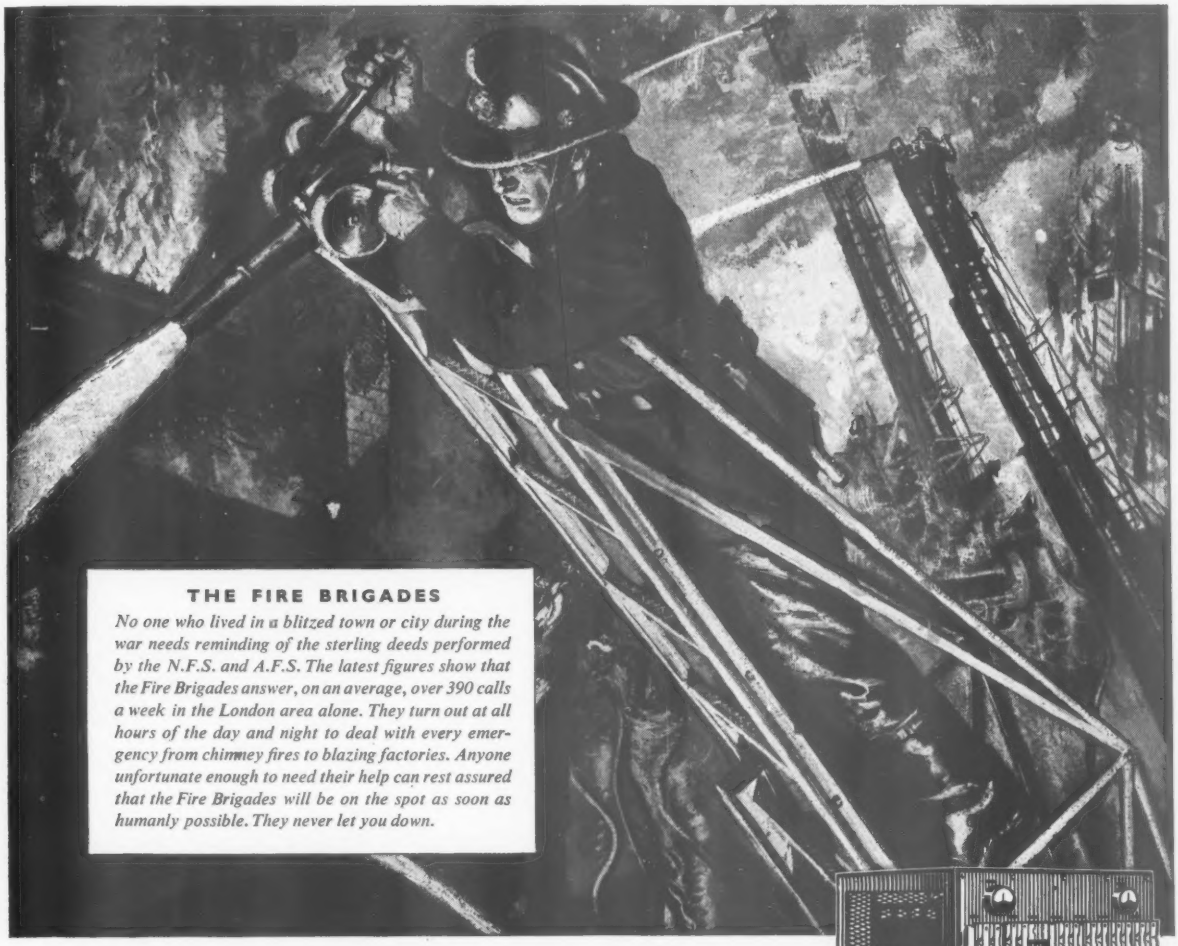


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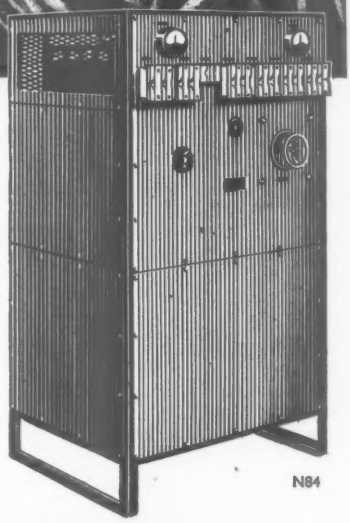
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90 in. diameter ARKAY Glass domes of ⅜ in.–¼ in. Rough cast plate. Architects: Adie, Button & Partners. Photograph by courtesy of A.P.V. Ltd., Crawley, Sussex.

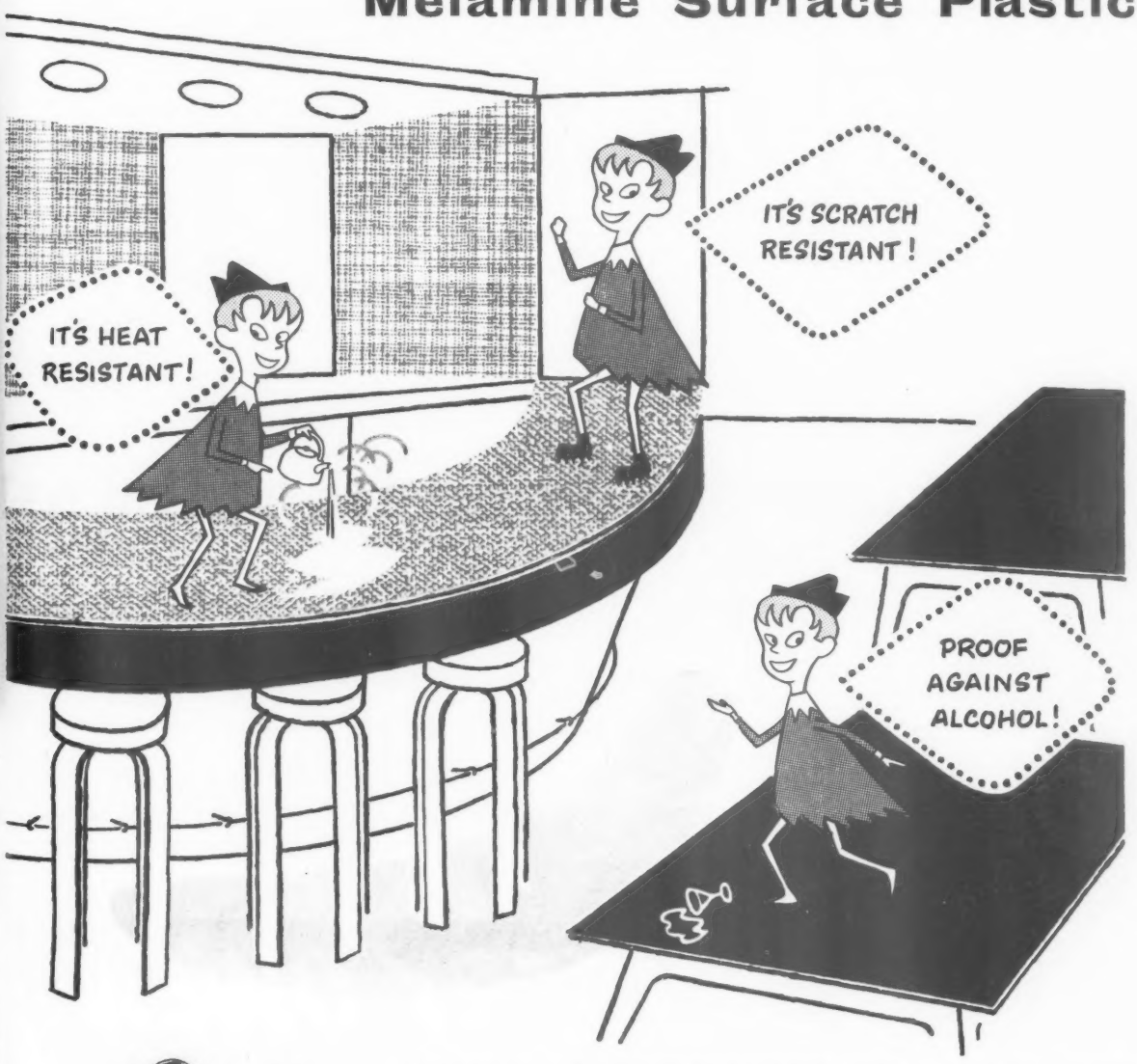
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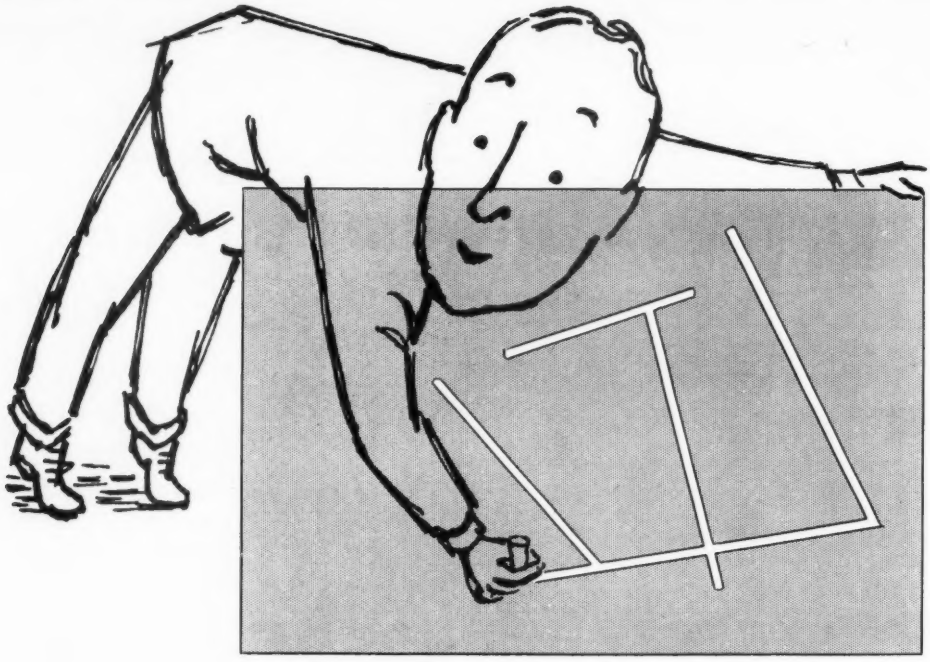
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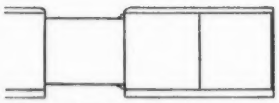
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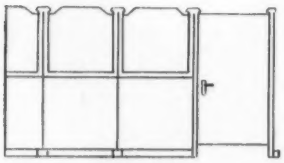
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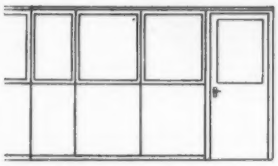
...but inner space problems baffled us!



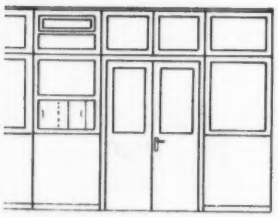
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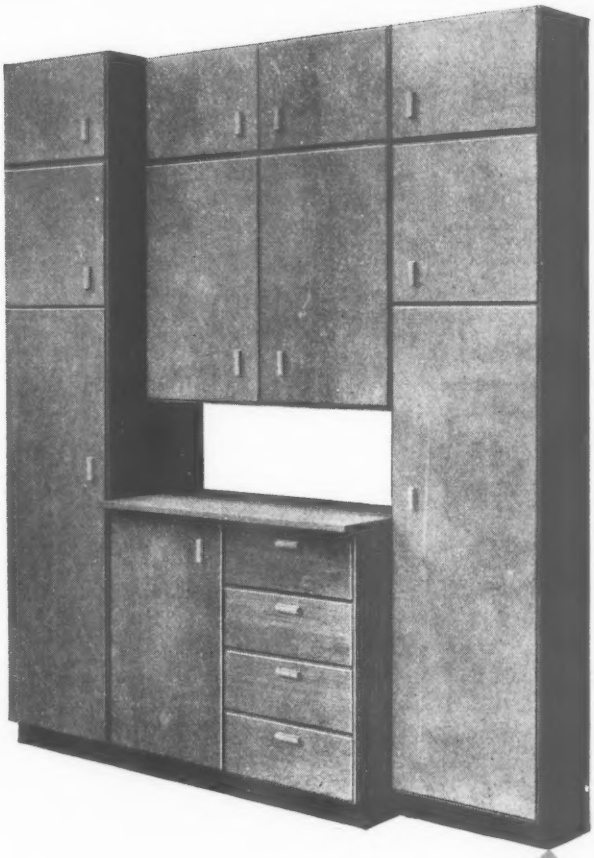
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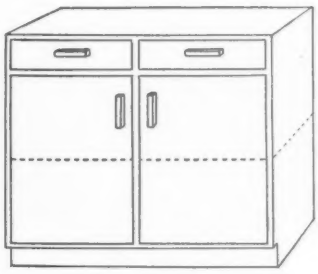


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Architects: Ogden and Raine, A.R.I.B.A.

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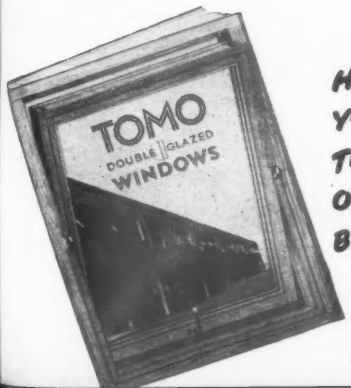
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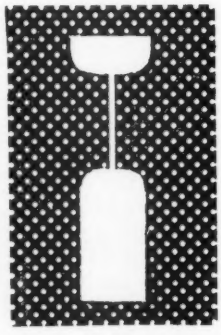
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SEPTEMBER



Above: National Water Park, Lymington harbour, one of the small multi-purpose boating centres serving the Solent, whose future is discussed as a matter of urgency by Geoffrey Robson.



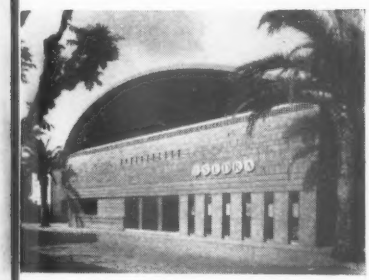
Suspended Ceilings, the conference room of an office block in Rome by Aldo della Rocca, from Michael Brawne's article on the aesthetics of suspended ceilings. (See also A. R. July and September Skill articles.)

Below: Bold Front in Birmingham, a new prestige office block added to an existing factory, by Erno Goldfinger, one of the buildings illustrated and described in this issue.



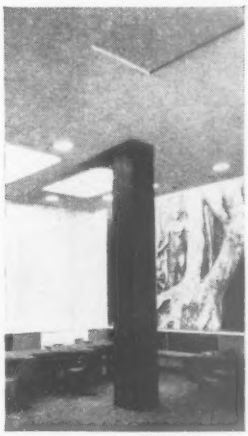
OCTOBER

Cinema in the Pineta; designed by Eugenio M. Rossi, and sited near the Roman Coast, its design involved some ingenious thinking about late-night ventilation in a close, damp climate.





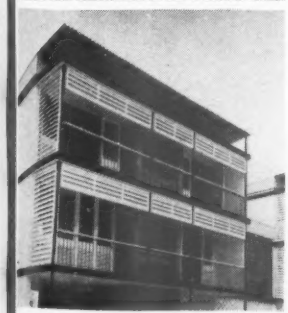
Brick and Concrete at Ham; a detail of wall, floor-slab, ventilator and gargoyle from a new flatted development at Ham Common by James Stirling and James Gowan.



Air Line Office; a tall black column in the new booking offices of Air France in Bond Street; designed by Charlotte Perriand (in collaboration with Peter Braddock), the first work in England of a designer who assisted Le Corbusier on some of his most famous interior work.

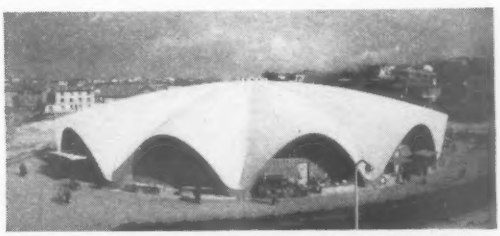
NOVEMBER

Sun-screens in Apapa; housing for the Nigerian Ports authority—this, and other recent work in West Africa by Architects' Co-Partnership will be described and illustrated in the October issue.





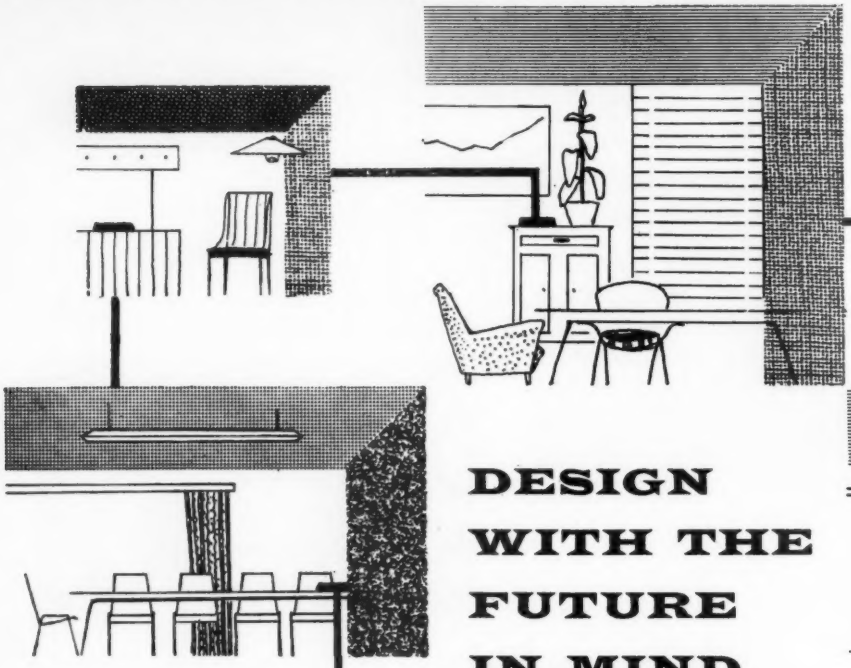
Seagram completed; and dwarfing even the Cadillac in foreground, the glass and bronze Seagram Building by Philip Johnson and Mies van der Rohe will be fully discussed and—tentatively—evaluated.



Engineering of Excitement; the covered market-hall in Royan by Simon and Morisseau, one of the buildings discussed by Robin Boyd in his article on the impact of new structural shapes on the architectural imagination.

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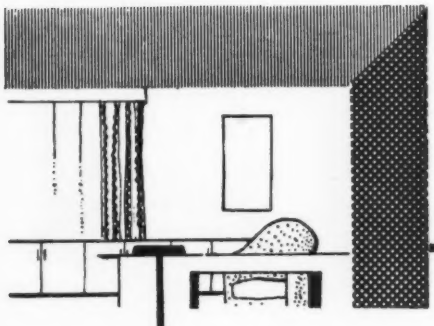


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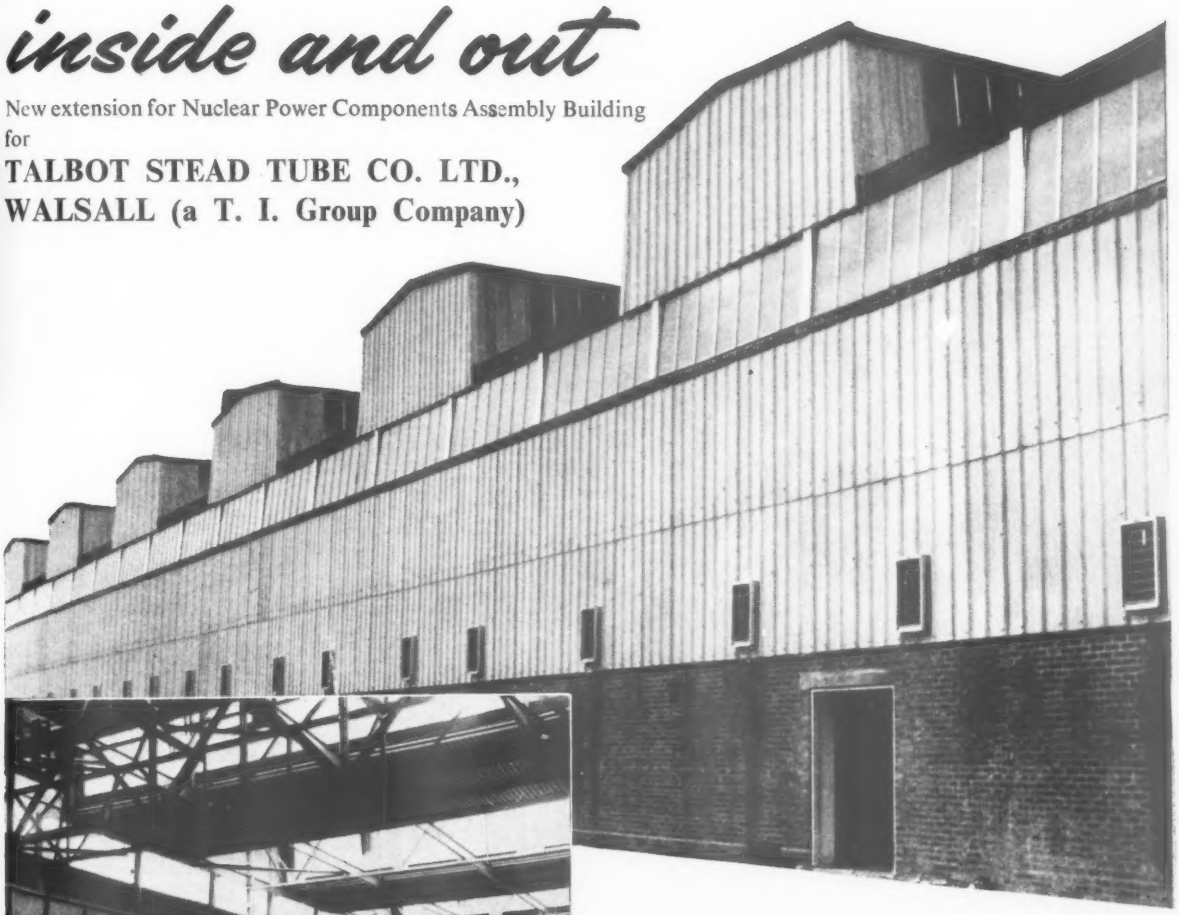
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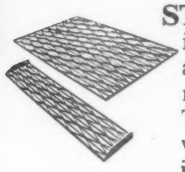
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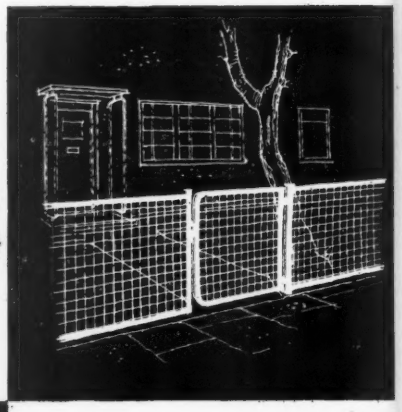
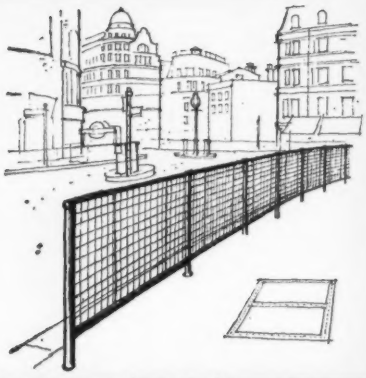
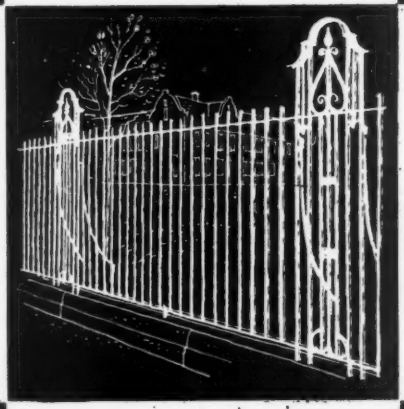
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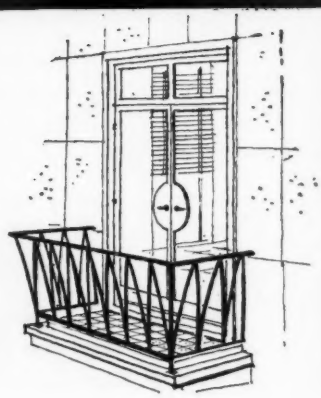
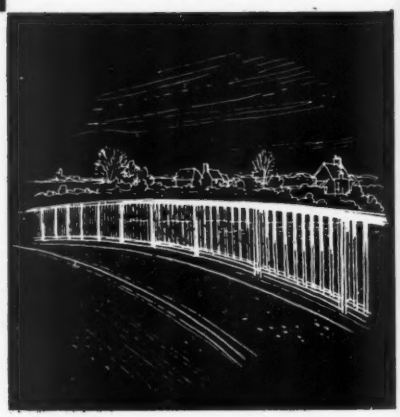
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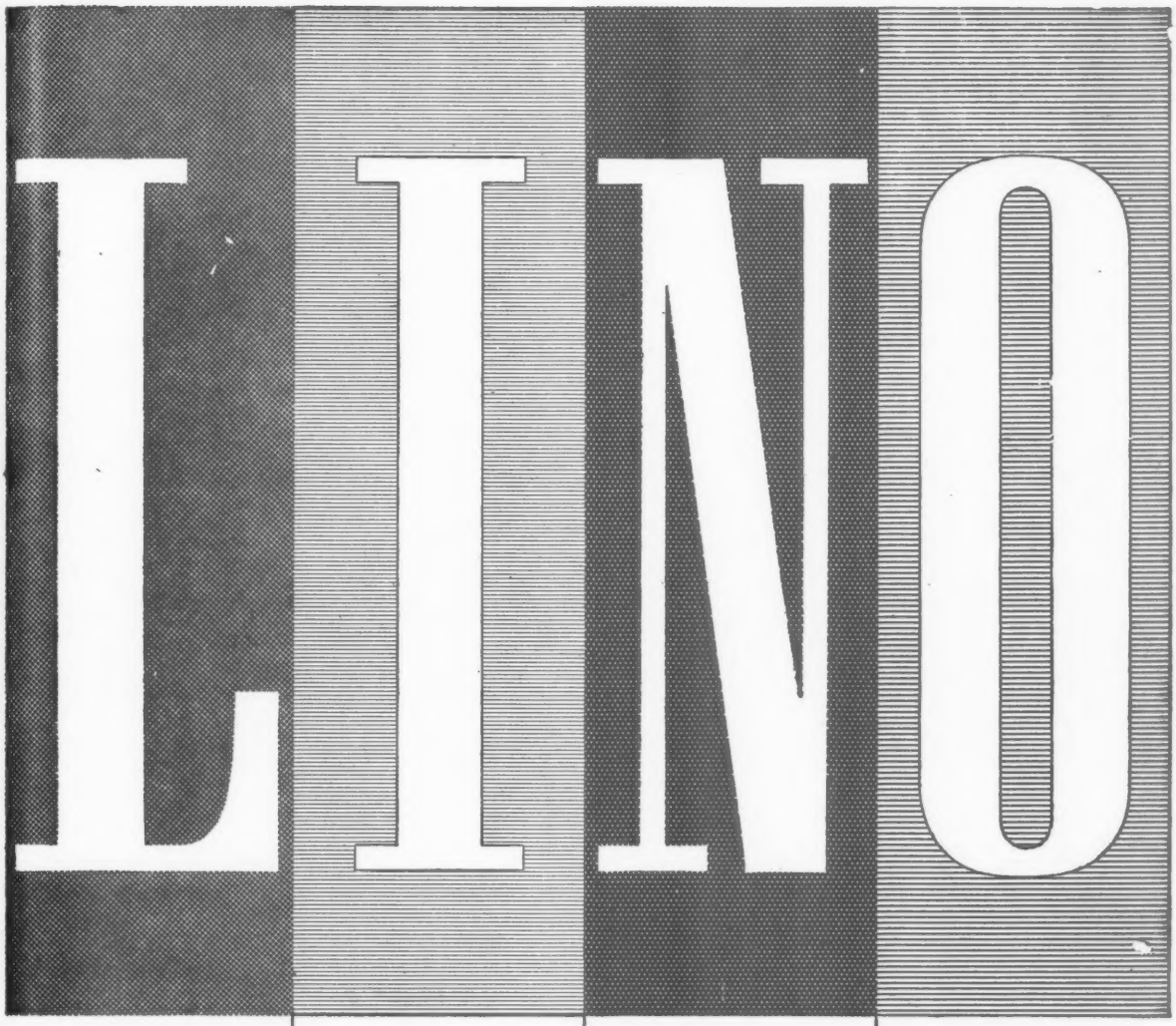




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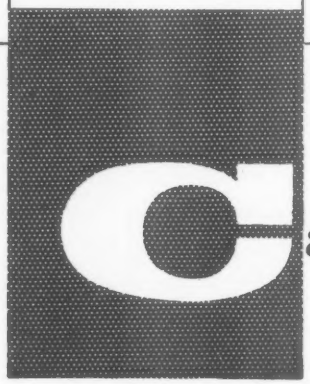
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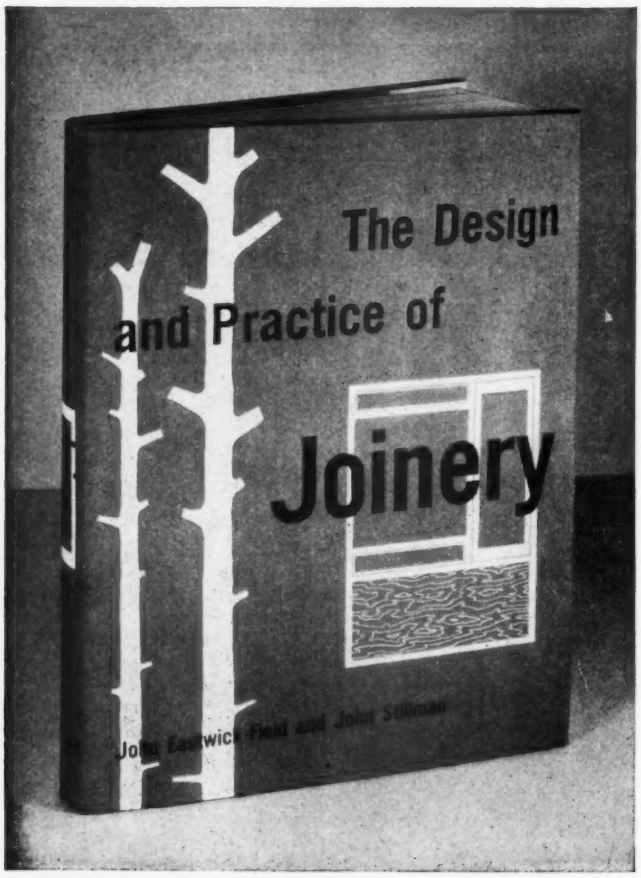
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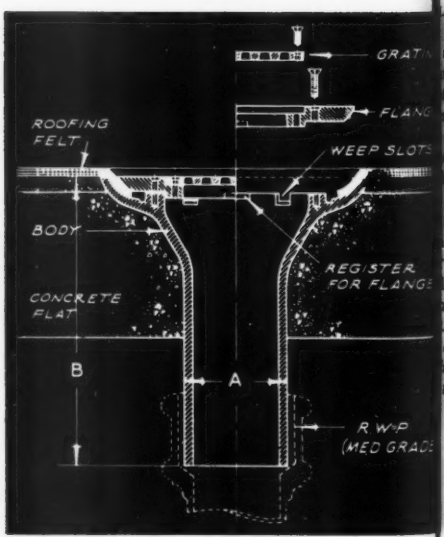


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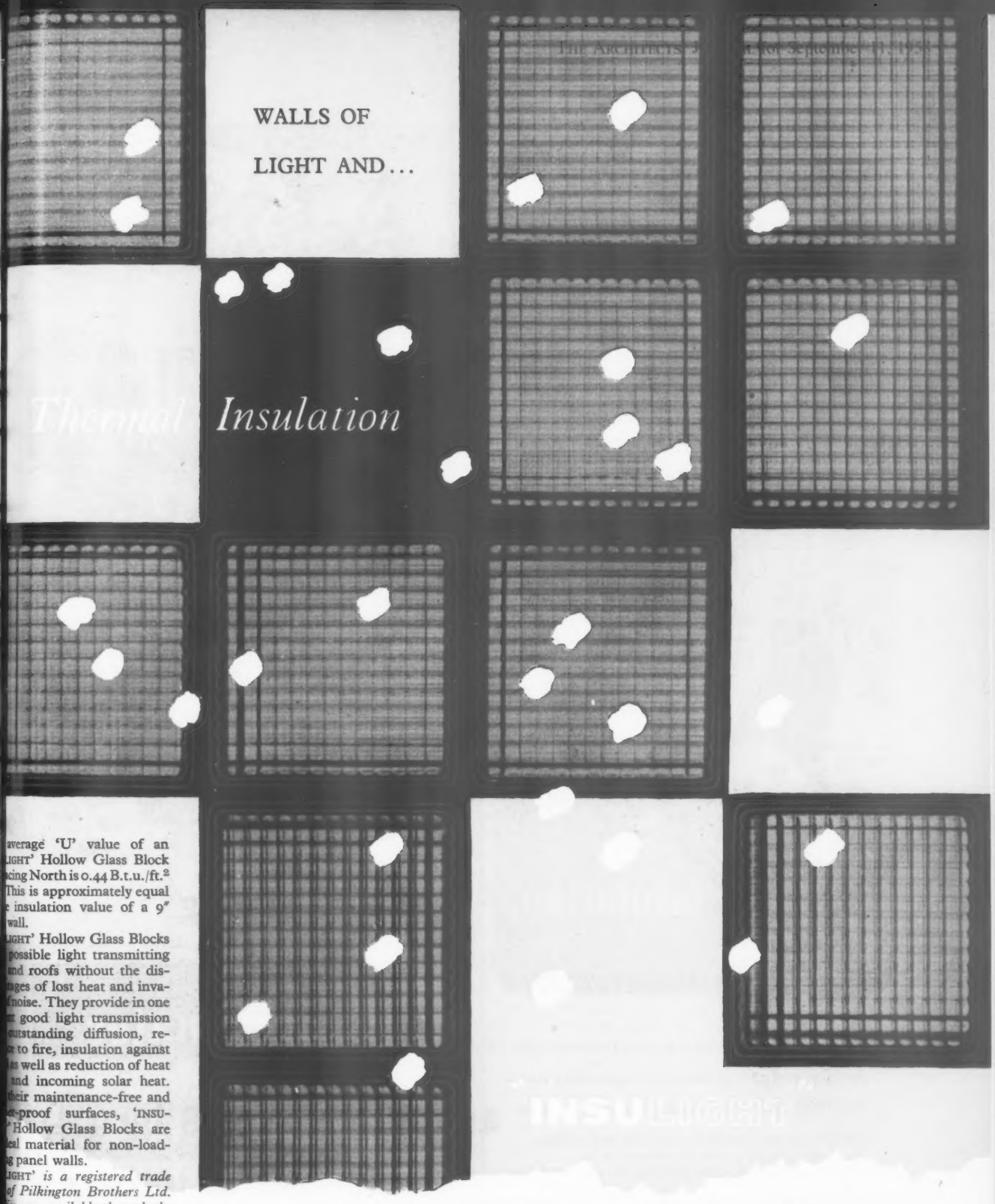
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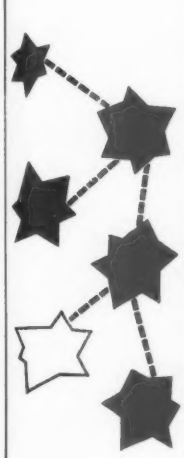
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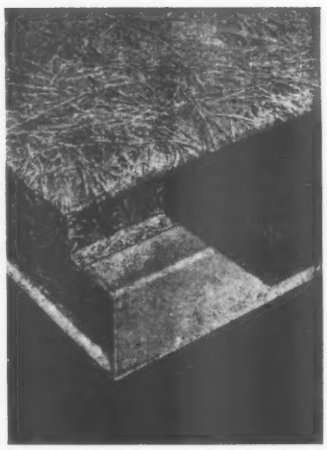
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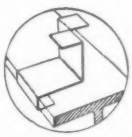


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THE ARCHITECTS' JOURNAL

No. 3315 Vol. 128 September 11, 1958

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NOT QUITE ARCHITECTURE

THE DEVELOPER

A brochure appeared on my desk. It had a blue cover, with a resolute-jawed naked male carrying in his arms, a factory. Across the top in yellow Playbill was the clarion word DEVELOPMENT. Inside, the first sentence read " The development of the modern factory has become the job for a specialist in this field."

*

The specialist is a Developer and he should " . . . improve the administrative side . . . know, examine and use the best construction techniques," and his personnel " ought to be essentially commercially minded industrialists."

*

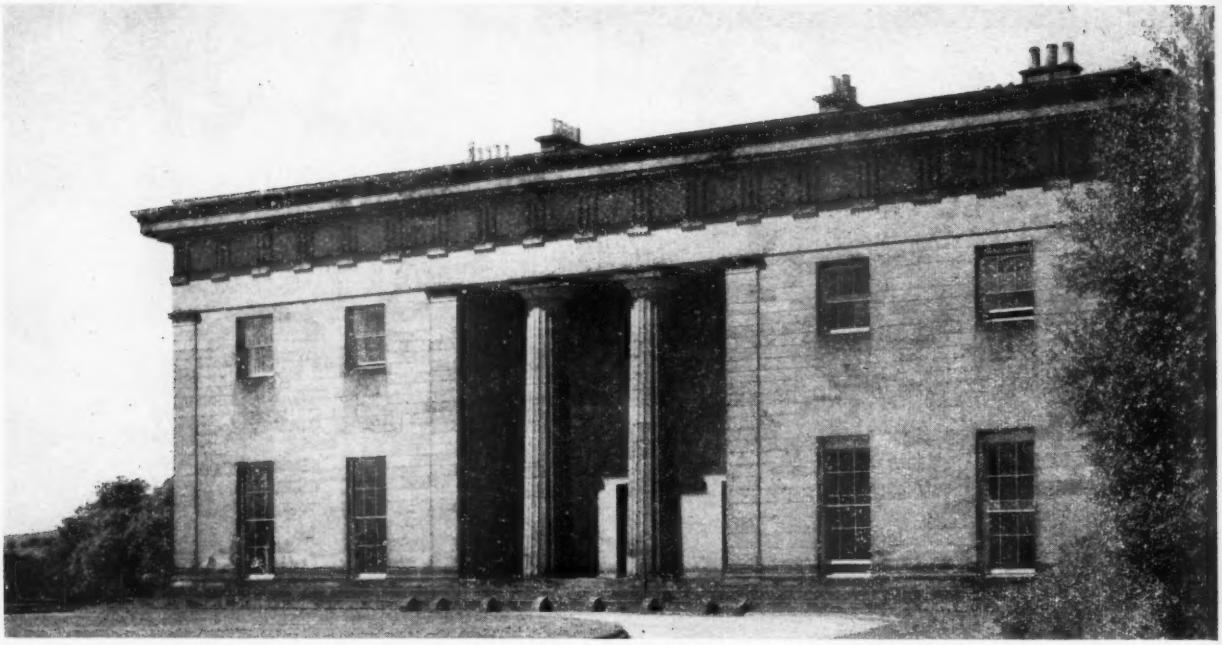
The brutal truth is put, but sympathetically, on page 9: " industry has sought to make the architect a combination of real estate consultant, town and country planning specialist, a financial advisor, a co-ordinator of research and planning of civil engineering works, and finally, of all things, an executive director of a highly complex line production job." From this crushing burden, the Developer has relieved him, for in his organization " the architect's place is one of *equal* standing in a team consisting of Developer, Consultants and Contractor (because) the main accent is on functional efficiency."

*

After this there follows a photograph which may be imagined from the caption: " The team in action. Gathered round the table on the site itself, consultants and contractors thrash out each problem as it arises."

*

What does the Developer do for his client? He will find the site; make all the legal searches, get all the town planning and bye-law consents, provide all the structural, mechanical and electrical (and architectural) consultants. Instead of paying lots of different fees, the client pays a Developer's charge and he does not even have to buy





In Good King George's Gothic Days

Comment has already been made, in the ARCHITECTS' JOURNAL and elsewhere, on the way in which Christopher Hussey's volumes on English Country Houses are stretching our interpretation of the word "Georgian," and the third volume, on the period 1800 to 1840, is no exception. It covers houses as different as Belsay Castle, top, whose extreme Neo-classical restraint is due to its owner-designer, Sir Charles Monck, and Belvoir Castle, above, whose crenellated fantasies are due to James Wyatt and the Duke of Rutland's gothic-minded chaplain, Sir John Thoroton. The two houses are near-enough contemporary—how can they be considered as representatives of the same "Georgian" style? Mr. Hussey proposes a common reliance on picturesque theory, and ASTRAGAL dissents on p. 366.

his tailor-made factory—he rents it from the Developer. And quickly—they built an electronics factory in 12 months, a biscuit factory in 30 months, a £¾ million warehouse 6 months ahead of contract, and a 113,000 sq. ft. fruit juice factory in 47 weeks.

*

Appearance? Well, while I was immersed in this world of commercially minded sound thinking, my thoughts floated back to days in the studio, to passionate arguments about the Modulor and Mannerism, to lectures on lead rolls and deep wells, to the widespread conviction that clients were bourgeois Philistines and all new buildings unbelievably bad—and to unwilling study of Hamilton Turner who surely never dreamed of the Professional Practice and Procedure described in this brochure.

*

The stock response to the all-in service is that " it can't produce Architecture " but the buildings here proudly displayed seem neither more nor less appealing than those produced by the long-winded, piecemeal and uncertain procedure that the schools prepared (or rather didn't prepare) us for. If the idea of ourselves that we cherish were really true, the yielding of some of our authority to the builder, the engineer and the accountant would surely betray itself unmistakably in buildings so produced ?

*

Is it that the all-in services haven't been going long enough to lose a guilty regard for the architect's historical prestige ? Or is it that the treasured isolation of professional independence is just as fettering as being overruled by " equal " team members ? Ideas for negotiated contracts and fee sharing schemes, pious injunctions to study " management " and programming—the progressive response to the threat of the " developer "—are no doubt necessary, but I have an idea that our old and unfashionable friend of studio arguments, the " concept of architecture," needs looking at again.

JOHN CARTER

DIARY

Modular Assembly After its Erection. Modular Society Forum at the BC, 26, Store Street, W.C.1. 6 p.m.
SEPTEMBER 24

The RIBA Form of Contract. Talk by Michael Chavasse, IQS meeting at Caxton Hall, S.W.1. 6.30 p.m. OCTOBER 3

Housing Centre 21st Annual General Meeting. Professor Sir William Holford will preside. Lady Allen of Hurtwood will speak on " Vital Space for Play." At the HC, 13, Suffolk Street, S.W.1. 4.30 p.m.
OCTOBER 7

Architecture in Jamaica. Illustrated talk by David Oakley, late Senior Architect, Dept. of Housing, Jamaica. At the AA, 34 Bedford Square, W.C.1. 6.15 p.m. OCTOBER 15

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* To preserve freedom of criticism these editors, as leaders in their respective fields, remain anonymous.

The Editors

PROGRESS WITH COST CONTROL

IN this month's *RIBA Journal*, the Institute's Cost Research Committee publishes a summary of the evidence and information it has collected. It describes the experience and opinions of several architects and quantity surveyors, and the methods of cost control in use, with the object of " stimulating further acquisition and exchange of knowledge." Although parts of the report are not new to the cost conscious, it forms a comprehensive record of what the profession is doing and thinking about cost control.

Few of us, it seems, practise any specific " system " of control—but a great many are " cost conscious "—a fact in which the JOURNAL can take some pride, for it was the 1955 Guest Editors' articles on The Cost of Building and subsequent published cost analyses that largely stimulated many later developments. The report shows that there has probably been sufficient experiment with control methods—including elemental cost planning—for more widespread trials to be made by other architects and quantity surveyors. This implies three things: closer co-operation between the committee and the RICS Cost Research Panel, for joint encouragement of the rank and file of both professions; agreement on a " Code of Practice " for cost analyses and more frequent publication of articles and research papers by the RIBA committee. Perhaps the most significant single conclusion in the report is that systematic cost planning can greatly improve the confidence between architect and his client.

A BOLD PROJECT FOR REFORM

The evidence submitted by the RIBA to the Royal Commission on Local Government in Greater London is a refreshing contrast to the special pleadings of the various interests, political and other, whose evidence has so far been published. It would be fatal to the prospects of a reform that is more than half a century overdue if the sublime satisfaction of London and Middlesex County Councils with the *status quo* were to carry any weight with the Commission, or if the Commission were to heed the clamour of the smaller and least efficient

authorities for the dismemberment of the LCC and the transference to them of much of its planning and architectural work.

The RIBA proposes that the existing structure (including the LCC and, one presumes, Middlesex County Council) be swept away, and replaced by authorities on two levels. At the upper level an elected Greater London Council would be responsible for regional planning and overall control of the construction of buildings. At the lower level Greater London (not just the LCC area) would be divided into City Districts, each with an elected Council with powers comparable to those of the County Boroughs. The need for a regional planning authority, and for uniformity of building regulations and control throughout Greater London, are self-evident. The RIBA has already made clear its opposition to any transference of building control to minor authorities, and its proposal to achieve a common standard throughout Greater London will be warmly welcomed. If the proposed Greater London Council is to discharge either of these functions well, and particularly the control of building, it should itself be a building authority. It should not usurp the normal school, housing or other programmes of the City District Councils. But, particularly if the RIBA's proposal to extend the area of Greater London to include the new towns is accepted, as it should be, the Greater London Council would be the appropriate body to build new towns or to undertake major town expansion schemes, and possibly to initiate pilot schemes in other fields.

The City District Councils would have to be large enough to have independent architects' departments responsible, as in the LCC itself, for all architectural and town planning work, able both to attract staff of the right calibre and to organize a sufficiently large and continuous programme of work.

Nothing would be easier, however, than to break up the LCC in such a way as to destroy not only its faults of bureaucracy and excessive size, but also its undoubted advantages of large-scale organization and contracting, and its rich architectural and town-planning experience. The RIBA's evidence does not indicate what it considers to be the optimum population for a City District, to enable it to provide architectural and town planning services of the highest quality. Although size does not, by itself, guarantee success, to divide London up into excessively small administrative areas would certainly guarantee failure. This is a key question on which research is urgently required.

It would be equally interesting to know what evidence, if any, has been submitted by the City and Borough Architects' Society, and by the County Architects' Society, both of which can powerfully assist the cause of reform if they care to do so. We hope, too, that the RIBA will submit evidence, in consultation with the Allied Societies, to the Local Government Commission for England on the reform of local government in the conurbations that are to be the subject of special review.



TIME FOR URBAN RENEWAL

A fall of 25 per cent. in industrial building would not affect architects as severely as cuts elsewhere. But the forecast of a 25 per cent. fall in industrial investment in building in 1959, reported in the *Board of Trade Journal*, would be a nasty jolt for the industry and for our profession, too. It it possible that the firms which make these forecasts may be exaggerating. On the other hand, it would be reasonable to expect some such result from the prolonged effects of the credit squeeze, only now ending, and the general lack of confidence in the future expansion of trade.

*

ASTRAGAL, who is no economics expert, has no idea how to boost industrial building. But if the boom in industrial building, and possibly office building, is coming to an end, isn't it silly to keep such a tight curb on local authority building? This would seem a good moment to embark on big plans for urban renewal. It seems rather absurd that we should all be encouraged to buy new cars and tellies on borrowed money if there is still a limit on the loans available for civic enterprise.

THE STATION NOW IN TRAIN . . .

Although British Railways are contemplating the demolition and recon-

struction of King's Cross station no plans have yet been approved. This station, while fully as grimy and awkward as any of the other main line termini, and unquestionably fuliy as much in need of a complete reconstruction to fit it for modern electrical and diesel working, happens to be one of the finest examples of engineering architecture. Unfortunately, the appalling clutter of temporary buildings, unused underground stations and shops that have grown up in front of it make it difficult to see the main façade properly. It would be wrong to insist on preserving the original station if that would prevent the building of a well-planned new one. But it seems a tragedy that one of the best stations may have to go while the worst remain. Can we retain the roof and the main façade?

WHEN'S THE NEXT PLANE?

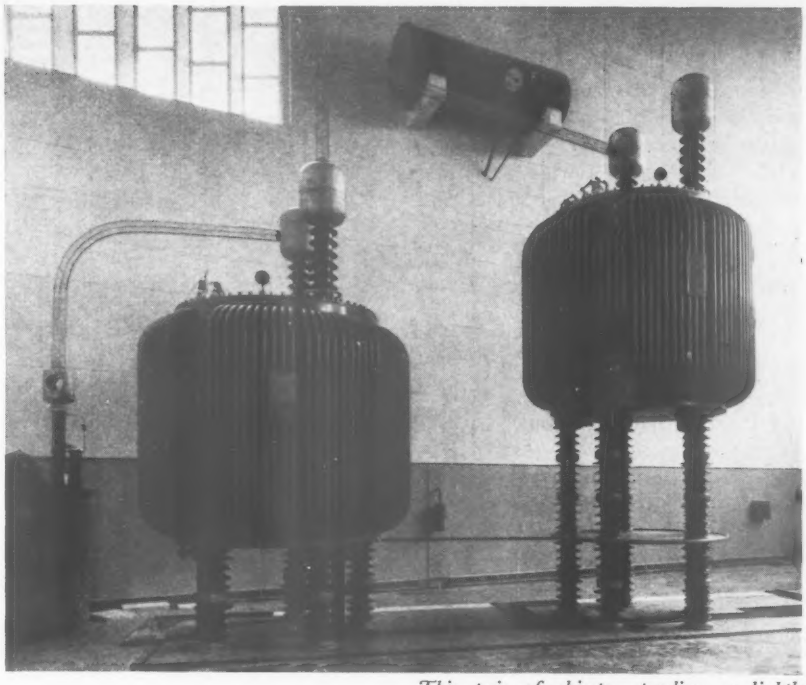
What is the scale fee in Saudi Arabia for designing a royal palace? The question, to which some of our Middle East practitioners may know the answer, is prompted by the action brought by an Italian architect, Armando Brasini, against the government of Saudi Arabia. He claimed the modest sum of £240,000 (Signor Brasini, we are glad to see, is not the sort of man who cuts his fees) for "planning a group of buildings, including a new palace for the king outside the capital." The buildings were never built, as the king preferred another design, and—so the king maintained—Signor Brasini only made a site visit and prepared a model.

*

Justice has now been done to Signor Brasini by an Italian court, which has awarded him £88,000. ASTRAGAL trusts that he is not too upset at the loss of the other £152,000. Even at £88,000 it must have been some palace!

YOU HAVE THE BEST LISTS?
WE WANT THEM

Do architects prepare and use check lists? ASTRAGAL believes that many of the more careful and conscientious do. Unfortunately not enough checking and counterchecking of check lists takes place to ensure that they are really infallible and, without doubt, there is little time in an average office to perfect these things. Some time ago ASTRAGAL was shown a check list which had been prepared for





This pair of objects standing so lightly linked, and vaguely emotive of some Martian Adam and Eve, will be recognized by readers as series resonant transformer/reactor units with a feed transformer. Even to the unknowledgeable there is given an impression of crude appositeness in the appearance of this equipment. Unfortunately the same cannot be said so readily about the building which houses it (the new laboratory for Enfield Cables at Brimsdown, Middlesex) despite the fact that the 45-ft. high laboratory is expressed in grey rendering and the three-storey offices are clad in brick and curtain walls. The lavishly lit first and second floors are offices. The small square windows on the top floor light a drawing office and the plenum chamber.

students at the Durham University school. It was quite good, as far as it went (which, being for students, wasn't very far), but it was said that the list was also used by some of the architects in the area.

*

A *thorough* check list for all types of design, or for all types of building or surveying operation, is just what the less experienced architect, or the head-in-the-clouds architect (a most valuable kind) needs to ensure efficiency. Why aren't more distributed at schools, or amongst office staff? And why aren't more published? The JOURNAL Editors would be glad to publish (and pay for) good check lists. If yours is not quite complete, why not, nevertheless, send it in? It might form an important link in the production of a perfect chain. Of course, the older, more efficient firms, may be reluctant to be as philanthropic to the other and rival members of their profession. Few architects today, it would seem, are as disinterested as Burnet, Tait and Lorne were when they published the famous series of Information Sheets (quite one of the most generous gestures, and one of the most beneficial to the profession, ASTRAGAL can recall). But nowadays the growing danger to the architect is not his fellow-architect—it is the big firm with an all-in service which can readily afford the best advice from efficiency experts.

ISAMBARD

In terms of architecture, planning and good layouts, Bristol has been aesthetically barren for many years. Is this why the younger Bristol architects are so enterprising? You will remember that local architects held a provocative exhibition on Bristol Subtopia and formed the Bristol Building Centre. Local architects have now formed the Bristol Design Centre (an admirable

venture, based on the idea of the London Design Centre, but quite independent of it). And it is a local architect who has now persuaded the *Somerset and Dorset Evening Post* to include a regular column (signed " Isambard ") entitled " Architects' Forum." The first two articles are properly critical and thoroughly competent. Congratulations to the editor for showing such concern for design and planning in the West Country.

PRE-VICTORIAN GOTHIC

Having kept an eye on the drift of Georgian Group opinion of late, ASTRAGAL was not very surprised to find that quantities of Tudorbethan, Hindoo, Gothic, Gothick and possibly Gothique, had got into the third volume of Christopher Hussey's trilogy* on Georgian Country Houses. Gone for ever it seems are those primitive and innocent ideas of Georgian as a style of classic regularity and Trystan-Edwards good manners.

*

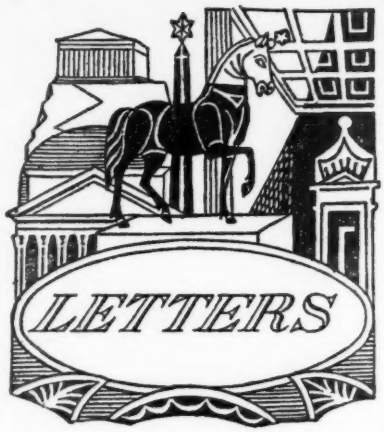
The Hussey position is quite clear on a theoretical basis—while purely visual and humanistic ideas (*à la* Geoffrey Scott) persisted, that was Georgian, but when Pugin and the higher morality took over, that wasn't. This, you will observe, brings Georgian down past William IV into Victoria's reign, so that a certain amount of Professor Hitchcock's " Early Victorian " gets into this volume, and this, in turn, makes life difficult when you begin to look at the buildings themselves. Barry's Italianate Shrubland Park is rated Georgian by Hussey, but his reworking of Wollaton at Highclere is not. On the other hand Anthony Salvin's reworking of Burghley at Harlaxton rates as Georgian, whereas Pugin's Scarisbrick—which is certainly no more tough-minded to look at than Salvin's work—does not.

*

It's a no-man's land, admittedly, so why not leave it to the indomitable no-men of the no-style period when any old style was as good as any other. That is, make anything that is recognisably classical Georgian, and make the rest Picturesque or, following Goodhart Rendel, the Fancy Style, and put them in another volume.

ASTRAGAL

* *English Country Houses, vol. III. Late Georgian*, 1800-1840; Country Life, 6 gns.



W. Campbell,
Director of Association of Heating, Ventilating and Domestic Engineering Employers

G. H. Buckle
M.Cons.E., M.I.Mech.E., M.I.H.V.E.

Leonard C. Howitt, F.R.I.B.A.

David Oakley, A.R.I.B.A.
Late Senior Architect, Department of Housing, Jamaica.

Norman and Dawbarn

Specialist Sub-Contractors

SIR,—Your readers will be aware that the Cost Research Panel of the Royal Institution of Chartered Surveyors have recently been discussing principles and methods of cost planning multi-storey housing schemes. The Panel have prepared a fourth paper presenting the background information to their forthcoming report to the Minister of Housing and Local Government.

Under the heading " Nomination of Specialists," that paper makes the rather startling statement that " If full advantage is to be derived from the cost planning and economic control of development then the nomination of specialists should be reduced to a minimum if not completely avoided," and later, " First, nominated specialist work restricts the items for which the contractor (*i.e.*, the main contractor), may tender; and secondly, it reduces the amount of site control afforded to the main contractor. . . ."

The form of Agreement and Schedule of Conditions of Building Contract issued under the sanction of the Royal Institute of British Architects, the National Federation of Building Trades Employers and the Royal Institution of Chartered Surveyors, has been widely used for many years. Clause 21 of that form provides, *inter alia*, that no nominated sub-contractor shall be employed upon or in connection with the works against whom the contractor shall make reasonable objection or (save where the architect and contractor shall otherwise agree) who will not enter into a sub-contract on the terms laid down in Clause 21.

It is a fact, as stated in the paper in question, that the work of nominated specialist sub-contractors accounts for a high proportion of the total cost of multi-storey development. Indeed, the growth of specialist work related to the building industry is the direct result of research and development sponsored, fostered and finalized by specialists and not by contractors. These specialists have become the butt of cost planners seeking to usurp the architect's freedom of design and choice and ignoring the development skill of the specialist.

It is to be regretted that the Cost Research Panel of the RICS should have seen fit to make these unwarranted adverse criticisms of the specialist sub-contractor and without adducing any evidence to support their view. It is hoped that, on further consideration of the matter, the Cost Research Panel will realize that the section of their report to which we have referred is both unfounded and unfair and that if specialist contractors are to be hampered in their research and development work the building industry and the country in general will be substantial losers.

W. CAMPBELL.

London.

[We think that the RICS Cost Research Panel ignored the deeper reasons for increasing nomination; and Mr. Campbell ignores the fact that Clause 21 of the contract fails too often to ensure harmonious contract organization.

Sooner or later the professions and the industry must ask themselves whether the ever increasing amount of genuine competition of *price* is the best way of getting value for the client's money. Developments in other industries and retail trades suggest that the age of belief in competition is over—that other incentives are taking their place.—THE EDITORS.]

Air Conditioning

SIR,—I am sadly disappointed in you. I read the ARCHITECTS' JOURNAL almost, I might say, from cover to cover and have appreciated its enlightened editorial view on engineering services.

But now, Sir, you have descended to lay reporting when describing a very interesting new building on the Great West Road, Brentford, for R. B. Pullin & Co. Ltd., you state: " the nature of the work necessitated a dust-free environment and consequently air-conditioning " while, later on, you detail air-conditioning as " warm air ventilation with filtration."

The term " air-conditioning " is now accepted by all authoritative bodies to include control of temperature and humidity, necessitating the inclusion of refrigeration plant, while the term " mechanical ventilation " describes the system where air is changed in a building by mechanical means and, although it can, in accordance with the scope of the design, be warmed or filtered, its humidity is not controlled.

With kindest regards and congratulations generally on your publication.

G. H. BUCKLE.

London.

A Suspect Reference

SIR,—I admired Grenfell Baines' rebuke on your editorial more than the Editor's endeavour to explain it away. The extract from " The Newleafe Discourses by Robert Kerr, 1846 " is suspect because it refers to the Royal Institute of British Architects.

If the Editors will read page 4 of the RIBA Kalendar they will learn that it was not until 20 years after 1846 that the word " Royal " was incorporated in the title by command of Queen Victoria.

LEONARD C. HOWITT.

Manchester.

" Rum Island "

SIR,—Michael Manser's garbled, and in some respects factually inaccurate, article on Jamaica (Not Quite Architecture, August 28) cannot pass unremarked upon since possibly some readers who have not had the opportunity themselves of visiting the island might imagine that it gave a true picture of life and conditions there.

Mr. Manser, with whom I am personally acquainted, is very new to Jamaica, and will

no doubt be able to contribute a balanced report when he has had the opportunity to become more familiar with Jamaica and the Jamaicans and has had more experience of the tropical world in general.

"Even Kingston has miles of rusty corrugated iron sheeting." What city of the humid tropics has not? And where is there a tropical country without its shanty towns? Those of Jamaica are not anywhere near as bad as those of parts of Africa and South East Asia, and since 1939 successive Governments have worked hard to improve conditions. In recent years I have had the opportunity to assist in this work myself.

Contrary to Mr. Manser, both private bodies and government are interested in, and spend money on, the preservation of historic buildings and those of architectural merit. To take one example—Fort Charles with Nelson's Quarterdeck at Port Royal was restored last year at great expense. Mr. Manser describes this as being "ill-cared-for." Has he ever been to Port Royal? One wonders.

The architectural atmosphere of Jamaica is one of optimism not depression. Admitted Jamaican taste at present is rather brash, but whose is not when he is first trying to make his mark in the world? From my own experience with Jamaican social workers, draughtsmen and young architects all are very enthusiastic to learn about, and improve their design appreciation and standards. The Jamaican Society of Architects, now seeking affiliation to the RIBA, is giving a lead to the architectural life of the Island and the Government is shortly expected to ask for a Register of Architects.

The firm of Norman and Dawbarn have done a great deal for the furthering of architecture in Jamaica. Most particularly have they led in job organization, quality construction and in achieving good finishes with indifferent labour. However I must confess to finding the University rather timid for exotic Jamaica and to preferring Ashwell and Dunn's School of Agriculture at Spanish Town. Truly the university is "unbelievably different from the rest of Jamaica, . . . "

Let us hope that the cultural values and aesthetic life evolving in Jamaica—in dance and painting it is already well established—will not be like our own. They would not be one little bit Jamaican if they were to be. Jamaica is shaking off the burden of its somewhat unfortunate history and in recent decades has taken great strides forward into the 20th century. In the field of race relations among a mixed community Jamaica's example is a light unto the world. So cheer up Mr. Manser!

DAVID OAKLEY.

Hemel Hempstead.

SIR,—We have read with intense annoyance an article on pages 289 and 291 of the ARCHITECTS' JOURNAL of August 28, 1958. It contains ill-considered comments on the Jamaicans and their environment which are insulting and untrue. These comments are aggravated by the fact that the author of the article sees fit to praise some of our own work.

As a firm with a long established office in the West Indies we wish to dissociate ourselves entirely from the contents of the article.

We have, during the last ten years, formed a strong regard for the Jamaicans and their country; we have received much kindness from them and have made many friends. We still regard ourselves as their guests and it is a matter of the greatest regret to us that an architect should have, in this way, abused their hospitality.

We cannot understand why an article which makes so negative a contribution to this country's relations with the West Indies could have been published just now.

NORMAN AND DAWBARN.

London.

NEWS

RIBA VIEWS ON LONDON GOVERNMENT

Greater London and District Councils Proposed

The RIBA has submitted the following evidence to the Royal Commission on Local Government in Greater London. Editorial comment is on page 363.

In submitting evidence to the Royal Commission, the main concern of the Royal Institute of British Architects must be for the furtherance of good planning and architecture in the Greater London area and for the effective and economical administration of planning and of by-law control. Clearly, good architecture and environment in any locality can be evidence of the excellence of the structure of its local government, as well as a vital contribution to the well-being of its inhabitants. It is hoped, therefore, that the proposals put forward here, with the emphasis clearly on matters of planning, architecture, and building control, will contribute towards the simplification and improvement of all aspects of local government administration in Greater London, a matter which must be the concern of any professional organisation.

Since the Local Government Act, 1888, brought into being the London County Council whose boundaries at that time roughly coincided with the extent of the built-up area of London, there has been such an extensive spread of the capital city into the Home Counties that the existing administrative boundaries of the County, and of other authorities within the built-up area and beyond, no longer relate to the reality of the situation. Within Greater London, as defined in the Royal Commission's terms of reference, there are six county councils, three county boroughs, 73 district councils, the London County Council, City Corporation and the 28 Metropolitan Boroughs.

In planning, the county councils are responsible for the preparation of development plans, but their powers of control of development have been delegated in varying degrees to the constituent district councils. In the London County Council area, except, however, in respect of the City Corporation, this delegation has hitherto been prevented by the Town and Country Planning Act, 1947, although, should it receive Royal assent, the LCC (General Powers) Bill, will permit a degree of delegation in respect of minor planning matters to the Metropolitan Borough Councils. As the county boroughs of East and West Ham and Croydon are all-purpose authorities this division of responsibility for development plan and for development control does not arise there.

As regards the regional aspect of planning the Ministry of Housing and Local Government is in a position to prepare a plan and secure its implementation. Over a long period regional planning for the Greater London area has been a matter of concern both to individual architects and to the profession as a whole as represented by the RIBA. When in 1927 the Greater London Regional Planning Committee was set up—a Committee which performed a valuable service in defining, and advising on considerable purchases of land for London's Green Belt—an architect, Sir Banister Fletcher, was appointed its Chairman. During the war, Members of the Institute worked voluntarily on the preparation of a regional plan for Greater London; in 1944 the then Ministry of Town and Country Planning commissioned the late Sir Patrick Abercrombie, F.R.I.B.A., to prepare the Greater London plan.

Since the publication of the Abercrombie regional plan, attempts have been made to secure administrative arrangements to ensure continuity of thought and action at regional level. The Clement Davies Committee were asked to advise the Minister on "the appropriate machinery for securing concerted action in the implementation of a Regional Plan for London as a whole," and in 1949 they recommended the establishment under the 1947 Act of a regional joint advisory committee under an independent Chairman. At the same time the minority report of the Committee recommended the establishment of a Joint Board of the constituent planning authorities in Greater London for regional planning with more executive power than an advisory committee. The Committee also recommended that a Royal Commission should be set up to examine local government in the Greater London area. No action was taken on either of the former recommendations, but the Royal Commission has now been appointed.

Meanwhile, the Ministry of Housing and Local Government has continued to be responsible for regional questions. The Minister, however, being in the position of arbitrator on town planning matters, is not able to sponsor a continuing regional plan, and so the various aspects of planning in London have tended to become split up between various Ministries and ad hoc organisations. For instance, the Ministry of Transport is the only body responsible for the road plan in the region; the Board of Trade has the responsibility for the industrial location policy and other bodies, such as the Metropolitan Water Board and the London Transport Commission, all deal with their separate aspects without a common meeting point which would enable them to merge their contributions into a single co-ordinated plan.

As regards architecture, standards of design have varied with the authority, but experience has shown clearly that large authorities such as the London County Council are in a much better position to command the services of first rate architects and planners. For most types of buildings the London County Council has made an outstanding contribution to a new London; in addition the Home Counties have been able to make an equally valuable contribution especially in educational buildings. All these authorities have adequately staffed architectural and planning departments. At county borough level, however, only one of the three county boroughs in the London region has an architectural and planning department, and amongst the smaller authorities, the borough councils and the district councils, only a small proportion have architectural departments.

Many only employ architectural assistants serving in the Borough Engineer's department. To a large extent this has meant that the quality of work done by these authorities often falls short of what is possible and desirable.

In any reorganization of local government in the London region, the RIBA is concerned to see that the administrative arrangements should permit a high standard of architecture to be attained consistently over the whole of that area, while securing the establishment of two levels in planning and in the control of the construction of buildings on the following lines:

(i) Regional, covering the whole of Greater London and including, in respect of planning, such aspects of roads, railways, port facilities, transport, overspill, industrial location and other matters, all of which can be described as strategic to London, plus overall control of the construction of buildings, aimed to achieve a common standard throughout the built-up area.

(ii) Local, where, in respect of planning, the main task is the implementation of detailed plans within the framework already laid down at regional level. Here architectural planning aspects involving questions of civic design are of first importance and competent architectural and technical staff are required to design three dimensional layouts and buildings, at the same time conducting day to day administration of building regulations.

In the event of a wholesale reorganization of local government in Greater London the RIBA considers that at regional level there should be an elected Greater London Council which would be responsible for all major local government of the kind described above. The Greater London Council would have responsibility for preparing and keeping under review a broad regional plan, reporting on progress and, if necessary, securing the implementation of the plan by providing financial assistance to areas where the need for reconstruction was greatest. It would also have responsibility for securing a consistency in the decentralization and location of industry and the movement of populations to new and expanded towns. In addition appropriate relationships would be established with the existing large public development authorities, such as the Port of London Authority, London Transport and so on. The Greater London Council should also be empowered to make all building control regulations for the area and be responsible for overall control of their administration, both as to the hearing of appeals and as to relaxations. This would constitute the regional policy level of local government.

At the local level it is considered that the region should be divided into a series of city districts which would be most-purpose authorities with elected councils having responsibility for local government functions including town planning, education, housing and slum clearance and the day-to-day administration of building regulations. They would require to be of such a size and have command of sufficient rateable value to enable them to employ the right calibre of staff. This would mean they would have to be very much larger than the existing Metropolitan Borough within the London County Council area or the district councils in the Home Counties.

In this way the present confusion of authorities would be replaced by a simpler and more rational structure of local government. Regional planning policy would be determined by a democratically elected body and local planning in the city districts would be sensitive to local opinion. The RIBA is mainly concerned with the principles underlying such a reorganization of local government to secure the highest standards of architecture and planning from the point of view both of efficiency and appearance, but considers that if these principles are accepted it would be possible to work out a division of Greater London into city districts which would bear a close relationship with existing community structures.

The Institute strongly maintains that these proposals must be considered together, to be accepted or rejected as a whole. Reorganization of planning and administration in the Greater London area into regional and local units would be unacceptable unless those authorities, assuming responsibility at the local level, were of adequate size—able, in the case of planning and architectural matters, for instance, to employ first class architects and planners, as is at present the case with the London County Council.

As already mentioned, existing Metropolitan Boroughs and district councils in the Home Counties would not be large enough to employ the qualified staff needed to carry out ably the functions of planning at the proposed local level.

The RIBA has been interested to note that the boundary for Greater London, as defined in the terms of reference of the Royal Commission, appears to run approximately through the centre of the Green Belt. Although the regional authority, here proposed, could come into operation over the area of Greater London as so defined, it nevertheless seems only right to suggest that if the case for a regional authority for the area can be thought acceptable, there may well be reason to consider Greater London as that area which includes the New Towns, covered by the Greater London Plan drawn up by Sir Patrick Abercrombie.

If these proposals for a major reorganization cannot be considered acceptable by the Royal Commission, the RIBA considers that a super-imposition on the existing local government structure in Greater London of a further ad hoc body to deal with regional problems would probably only confuse still further the local government administrative arrangements, adding yet another tier of responsibility. Already there is an undesirable overlapping of functions between authorities, and an ad hoc regional body, which might not be democratically elected, would not carry the necessary authority. Rather than this the RIBA would prefer to see the Ministry of Housing and Local Government once again assume initiating and co-ordinating powers for dealing with problems of the region as a whole. Even then it considers that this would not be wholly acceptable unless proposals on the lines put forward by the Barlow Commission were adopted, namely that a Committee of Ministers composed of Heads of Departments with powers for planning and development be formed having available to it a planning secretariat. This would bring together the various aspects of planning which are at the moment dealt with separately in the various departments.

The RIBA most strongly deprecates all moves which may reduce the efficiency of the London County Council by delegation of powers to the existing Metropolitan Borough Councils. The LCC is outstanding for the contribution it has made in architecture and planning since its formation, and in building by-laws has achieved a uniformity of administrative treatment which should, at all costs, be maintained, indeed extended to the whole of the Greater London area. If, therefore, the proposal for the enlargement of the area over which a single Greater London Council can secure co-ordination is not acceptable, it is considered essential that the LCC which at least covers a large part of the built-up area of London, should retain its planning, development and co-ordinating powers. Otherwise a confusing series of variations in the interpretation of planning and building standards is bound to develop, undermining standards which have been patiently built up over the last 60 years. Likewise, to carry out the work which any delegation of responsibility for planning and architecture would entail, the existing Metropolitan Borough Councils or district councils, with their limited financial resources, would be unable to employ the calibre of architectural and planning staff which the LCC already commands.

It appears to the RIBA that there is a strong possibility that all the existing larger authorities in the Greater London area will press for the retention of their existing powers, while the smaller ones will ask for delegation or further delegation of powers from these larger ones. To take these demands as a starting point for the establishment of an appropriate Local Government structure in Greater London would, it is felt, lead to a worsening of the present situation. Either the Royal Commission should consider complete reorganization as described, or else accept the status quo as preferable to further disintegration of the larger authorities, particularly the LCC by the delegation of their powers to the smaller ones.

Cost Control at the Design Stage

Under this title the Cost Research Committee of the RIBA publishes in the current issue of the *RIBA Journal* a summary of the evidence and information it has gathered.

The report thus forms a fairly complete account of the state of affairs of cost control in the profession. It is divided into three parts. (1) Experience and opinion. (2) Cost control methods. (3) Recommended sources of information.

The gist of Part 1 is that there is greater need for architects to inform their clients fully and reliably about cost: that the few architects and quantity surveyors who practise cost planning speak warmly of its benefits (to clients and themselves) and that the accepted ways of presenting information to builders—by drawings and bill of quantities are in need of overhaul.

There are those who say that the architect has too little time for cost planning, where others report their experience that it implies a more thoroughly organized attack on the drawings, reduces post tender price trimming and thus in the long run saves time.

Part 2, cost control methods, gives a brief explanation of systems employed by the MOE, LCC, George Wimpey & Co. (who have their own architect), Brunton, Hellard & Boobyer (private architects), the Sheffield City architect (on the Park Hill scheme), Sir Thomas Bennett and Grenfell Baines.

The "systems" described, are illustrated. For example, there is a "design-estimate programme" used by the chief architect of Wimpeys to co-ordinate the contributions of various departments of the firm. There is one of the drawings of reinforced concrete work—bound into the bill of quantities for the Park Hill Scheme: and a schedule of "alternative prices" that T. P. Bennett & Son use in agreeing with the client the quality of building he requires.

Part 3 consists of brief synopses of five articles on Cost Control which (presumably) the Cost Research Committee recommend. They include the famous MOE Building Bulletin No. 4 (Cost Study) and an article in the *Architectural Review* for April, written by the costs editor of the JOURNAL.

See our leading article on page 363.

Industrial Architects

At the invitation of the RIBA *Ad Hoc* Committee (Chairman: Richard Sheppard), twenty architects employed on the staffs of industrial companies met at the RIBA on July 22, for an informal exchange of views and information with a view to improving

the standard of industrial architecture. Stuart Bentley took the Chair, and architects attended from a wide variety of manufacturing companies and nationalised industries. Those present concluded that it was well worth appointing from among their number a small group who would go further into the matters discussed and report back to the main body. It was felt that such discussions and any considered judgments that resulted could form a valuable contribution to the work of the RIBA.

The small working group have had a preliminary meeting and have agreed as a first step to compile as comprehensive a list as possible of architects employed on the staffs of industrial companies. They are also collaborating with the Public Relations Committee.

While this work has had, necessarily, to be initiated by a small group of workable size, the interest and collaboration of all architects similarly employed would be welcome; and any architects in industry who have a contribution to make are invited to get in touch with Stuart Bentley, c/o the RIBA.

COMPETITION

Jose Batlle Monument

The National Committee for the monument to Jose Batlle Y. Ordonezx has announced some amendments to the conditions for the international competition for a monument to be erected in Montevideo, Uruguay. The final date for the receipt (not, as previously announced the despatch) of designs is December 15, 1959, for competitors residing in Uruguay, Argentina, Brazil and Paraguay, and December 30 elsewhere. The competition is in two stages.

The monument must be composed of two plastic elements, a sculptural part (which may be representative or symbolic) and an architectural part, a building which will combine the functions of a museum and a social research institute. The IUA representative on the jury of seven (which includes five architects) is Affonso Reidy, Brazil.

The conditions can be obtained from the Comision Nacional Pro Monumente a Batlle, 25 de Mayo, esq., 1 de Mayo, Montevideo, Uruguay.

FOREST PRODUCTS

Subjects on the Research Programme

The Council for Scientific and Industrial Research announce that it has decided that research on the following subjects should be undertaken at the Forest Products Research Laboratory:

(*i*) the pulping properties of home-grown timbers,

(*ii*) more work on the general properties of home-grown timbers.

An additional scientific officer will be appointed to take charge of the work on pulping. Otherwise all the staff required are to be provided by transfer from other existing work at the laboratory.

The Research Council has also decided that it is not possible to continue indefinitely at the public expense all the work which is at present carried out on timber bending, wood working, composite wood and wood protection. The value of the work is not questioned, but it is considered that the industries concerned which benefit from the work should do it themselves, or pay for it to be done.

The department is, therefore, informing the industries concerned that the DSIR will diminish progressively its expenditure on work in these fields, and will end it in five years' time. It will thus be open to industry to carry out the work or to pay FPRL to do it.

We continue in this issue a brief summary by Cleeve Barr of the main contributions to the IUA Fifth Congress. A general description of the Congress, its lessons for the Sixth Congress to be held in London in 1961, and a summary of contributions by Arthur Ling, Harry Churchill, Hernan Lurrine, C. Van Eesteren, and Liang Si-Cheng, were given in the AJ for August 28. The full proceedings of the Congress will ultimately be available, we understand, in the RIBA Library. A report by Cleeve Barr on current architecture and building in the USSR will appear on October 9.

IUA FIFTH CONGRESS

Planning in East and West

N. Baranov (USSR)
Urban construction and reconstruction, 1945-1957

N. Baranov had the fantastic task of trying to sum up in one paper the reports of all the national sections to the Fifth Congress. He acquitted himself ably, and his 25,000 word report is worth reading. As Vice-Chairman of the Congress Organizing Committee he played a major and statesmanlike role in framing the final congress resolution, which represented the highest common factor of agreement amongst the delegations on town-planning principles (see AJ, August 28, p. 298). It would be repetitive both of other contributions and of the resolution itself to attempt a full summary of his paper here, but some points of detail, and of emphasis, are worth comment.

The reports of national sections, he said, clearly show that housing, during the post-war era, has been, and still is, the most significant factor in contemporary town planning—even in countries, for example, like Chile, which was remote from the war, but still has a shortage of half-a-million dwellings.

Amongst the obstacles to progress, and quoting from western sources, he noted the private ownership of land, the absence of well-organized regional and national economic plans, lack of national resources, and, lastly, the shortcomings of architects themselves. "Until 1954, in the USSR, there was an incorrect trend in architecture. . . . Emphasis on the outward appearance of the main thoroughfares and squares . . . detracted architects from devoting attention to building technique, problems of scientific progress, economical spending, and the creation of comfortable houses for the population." But "a no less widespread malady among the architects of West European and American countries was the underestimation, or disregard for functional or æsthetic, sanitary or engineering problems in town planning, or the social, local, and climatic conditions. An attempt is usually made to camouflage these shortcomings by the expression 'universal architecture' . . . the malady of archaism, as well as the malady of constructivism or formalism, are the results of a one-sided interpretation of the essence of architecture."

Again, after a section in which he described the principles of the best contemporary town planning—the separation of harmful industries, the arrangement of residential buildings around schools, recreation spaces and shops, and the functional grouping of these units into neighbourhoods, and so on—he appealed for the establishment of a scientific basis for town planning and for "the academies of science and other research bodies" to provide a firm foundation for laying down the future lines of development of towns.

On the desirable optimum size of towns, Baranov considered that on both theoretical grounds and from experience, a strong case could be made for a population of 80-100,000. Nevertheless, between the limits of 20,000 to 250,000 population a successful and economic solution of the problems of zoning, traffic, communal facilities, services, including heating, and so on, can be achieved.

In a section devoted to traffic and transportation he drew attention to the fact that due to "noise, automobile exhaust fumes and vibration . . . living conditions of people in front flats are much worse than the living conditions of people in side streets . . . (whether on) Sixth Avenue, Piccadilly Circus, the Grand Boulvards, the Sadovaya Circle in Moscow or Nevsky Prospect in Leningrad. . . ." He believed that "civic buildings and shops, *i.e.* congestion points of traffic and pedestrians, should not be located along traffic arteries. There must be a new architectural and planning solution for the centres of big cities. The main streets and squares should be located near traffic arteries and parking places. They should not be overloaded with streams of automobiles, but have greenery and be designed primarily for pedestrian circulation. The very idea of planning squares and streets as one huge mass of buildings cannot be considered progressive. In solving this problem, the methods employed in the

centres of Coventry and Rotterdam are of considerable interest. . . ."

On city transportation, he believed that "the existing type of suburban railway station must be replaced by a new type of transfer point where Metro trains stop along one side of the platform, and suburban electric trains stop on the other."

"The purpose of prefabrication," he said, "is to transform the construction site into a site for assembly of factory-made elements and building parts." He noted Britain's early post-war experience in prefabricating entire buildings, and the experience of other western countries, including the USA. "In the USSR between 1953 and 1957, building with large blocks and large panels increased nearly eightfold . . . and the weight of large buildings was reduced to one half."

"The location of prefabrication plants is of great significance. It is of advantage to place them in areas where building work is concentrated . . . to eliminate long haulage and reduce the cost of building . . . Since the erection of these plants may precede basic city planning . . . the volume and location of building work must be determined in advance. . . . The location of plants, and the planning of railways and roads, must be an integral part of district planning projects, and master plans."

In regard to "the rational use of the land," he quoted the case of Leningrad, which after the war, revised and elaborated the master plan drawn up in 1935. "For the same population, the area planned for the city was reduced by 36 per cent. . . . This was accomplished by:

(*a*) increasing the density of buildings in residential areas;

(*b*) eliminating elements of "giant-mania" in the dimensions of projected avenues, streets and squares;

(*c*) more rational planning of large industrial, transport and warehouse land . . .

"The general reduction in the area of Leningrad, made it possible greatly to reduce the volume of underground services, the length of metro lines, of streets and embankments, the number of bridges and viaducts, the quantity of rolling stock, the size of maintenance shops and so on. The decrease in area of the city has reduced capital investments by 10,000 million roubles (£909,000,000)*.

"An analysis of the accepted land use in big cities, said Baranov, shows that the average proportions of the various parts of the city fluctuate as follows:

Residential	30-50 per cent.
Industrial	10-20 per cent.
Warehouse	3-5 per cent.
External transport	5-15 per cent."

While most city planners concentrated on the residential zones, building on the remainder was often irrational. Yet it was precisely in these other zones, that a more rational distribution and planning of land use, could in fact save land, thus increasing the proportion available for residential purposes, and saving 5-10 per cent. overall of the city area. He instanced Magnitogorsk, where the first site chosen was too close to the huge iron and steel works, as an example of a major failure on the part of city planners. Here, the site had subsequently to be abandoned, due to smoke-dust, and a new one chosen, with great inconvenience to the population and great expense.

In a final chapter on architectural and aesthetic problems, Baranov found himself on rather sticky ground in trying to define "the socialist basis that determines the formation of the architectural aspect of the socialist city." After dividing the world neatly into two social systems, socialist and capitalist, he did not get much farther than listing a string of qualities for the former which would have been equally aceptable to the authors of the British New Towns, Vallingby, Rotterdam, Coventry, or any other example of progressive west European town planning (*e.g.*, "no slum areas and fashionable burgeois-aristocratic districts," or "the architectural composition of civic centres as the crowning point of the entire area"). He concluded, however, that "the architectural aspect of the socialist cities still reflects the process of creative search and a new architectural style has not yet been created." This was the big task still facing Soviet architects.

Jean Fayeton (France)

Problems of technique in Western Europe

Jean Fayeton described the importance of housing in relation to the building industries of Western Europe, and its significance in stimulating the industrialization of building. It is a field in which the governments have had of necessity to assume the direction and control of building activities. He summarized the existing demand for dwellings as follows:

	Total annual requirements	Annual requirements per million population.
Western Germany	400,000	8,000
Denmark ...	29,000	4,700
Spain	90,000	3,215
France	330,000	7,000
Great Britain ...	300,000	6,000
Netherlands ...	60,000	7,500

In all these countries economic dwellings were tending to belong to one of the following types:

One or two storied family houses.

Four-storied blocks without lifts.

12-17-storied blocks with lifts.

In general also, in all these countries, steel-framed buildings were disappearing. Buildings up to five stories were most economic with masonry or *in-situ* concrete bearing walls, and tall buildings with reinforced concrete frames.

Fayeton described the part played by architects and the extent of scientific research being carried on. He stressed that architects had a great rôle to play in defending human values against a "dictatorship of engineering and economics." On the other hand, architects should never dissociate themselves from industrialization, but should attempt to control it, because it gives us the means to rid humanity of slums and to provide decent homes. To date, new techniques in Western Europe had not led to substantial economies in building costs. Nevertheless these techniques had stimulated further progress, and had reduced by nearly one-half the labour required in building, as compared with traditional forms of construction.

E. J. Kump (USA)

Mass-production techniques in America

Three basic conditions were necessary, said Kump, before mass-production techniques could be developed. These were a mass market, mass credit and a high degree of industrialization—and all these existed in the USA. The impetus towards using such techniques in building came when mass credit was made available from public funds for large-scale housing and public works projects in the thirties. The evolution of such techniques started with research, undertaken by the AIA, by the Government, and by private manufacturers and research institutes, and directed towards the dimensional standardization of building projects.

Other helpful factors were the pre-fabrication and finishing of materials, the factory sub-assembly of large components, new methods of transport and of handling, new materials with a greatly reduced weight-strength ratio (plastics, metal alloys and pre-stressed concrete products, as well as timber), and finally the module. He regarded the principle of the module as a design element, as one of the most important factors of all. Great progress had been made in schools and public buildings, particularly in developing three-dimensional modular structures within which assemblies of curtain walls, heating, ventilating and lighting elements were all co-ordinated on modular dimensions.

Luben Tonev (Bulgaria)

Social and economic aspects of building in the socialist countries

In this review Tonev, who is the Director of the Town Planning Institute of the Bulgarian Academy of Science, covers the East European republics, East Germany, Yugoslavia, North Korea, China and the USSR. He replied in detail to a questionnaire issued by the IUA organising cimmittee, setting out a string of questions concerning the effect on town-plainning practice of the economic, social and legislative systems of these countries. Necessarily this is somewhat repetitive, but it is interesting to note that there is in fact a great deal of difference in practice, in these various countries, in the extent of centralised control over the preparation of town plans and in the initiative left to the local authorities.

To some degree this is affected by the extent of private ownership of land. In the USSR all land is vested in the State, and private ownership of land does not exist. In Poland, Czechoslavakia and East Germany, state ownership applies as yet only to war devastated towns and frontier areas. In China all land in urban areas has been nationalised. In Bulgaria, Hungary and Roumania, by and large, only the large landed estates have been nationalised. Town planning legislation depends therefore very much on "the stage of socialist development reached."

Similarly, the extent to which town planning is integrated with a national economic plan, or the extent to which building regulations and standards are codified, varies greatly between countries.

* At the official rate of exchange

In discussing what obstacles or difficulties exist in the way of town-planning projects in "socialist countries" Tonev enumerated a number of interesting points:

(*a*) An obstacle common to practically all these countries is the alterations, which occur in the national economic development plans, with consequent variations in capital investments, and necessary amendments to or disruption of town plans.

(*b*) Again, funds for actual building work are supplied by a variety of national and local departments and organisations, and this fact causes delays both at design and construction stages. The recent steps taken by the USSR to concentrate all capital investments in the hands of municipal authorities regardless of the actual occupier, are regarded as a model for the future.

(*c*) Further obstacles include (*i*) the enlargement of industrial enterprises situated in non-industrial areas, "temporarily or otherwise," as a result of the exigencies of national economic policy; and (*ii*) failure to demolish "temporary structures" or to clear obsolete and insanitary districts, as a result of acute housing shortages.

(*d*) Finally, in some countries, notably China, Roumania, Yugoslavia, Poland and Hungary, there is an acute shortage of qualified architect-planners and specialists capable of preparing and carrying out development plans.

Rudolf Hillerbrecht (Western Germany)
Economic, social and legislative principles in Western Europe

Professor Hillerbrecht summarized reports from the national IUA sections of France, Germany, Gt. Britain and Holland, Italy, Switzerland, Spain, Denmark, Norway and Sweden. In a brief history of the growth of town planning principles he acknowledged the initiative set by Britain in establishing building legislation during the last century, and of the post-war town-planning regulations. Said that "British and Swedish legislation conform best to the requirements of modern town building." He described the various methods used in the west for preparing, approving and implementing town plans, and stressed two main points—first the importance of maintaining self-determination and the rights of local communities, second, the cardinal importance of maintaining private property in land. He urged the formation of special bodies to simplify the process of purchasing land, and special courts to settle disputed questions. In describing the British procedures for establishing satellite towns, he succeeded in tracing the tradition back to the colonization of ancient times and to Aristotelean ideas—which was quite a feat. He concluded a comparative analysis of western legislative principles affecting town building, with a series of recommendations for improvement. One could not help feeling, nevertheless, that his suggestions, although admirable, were platitudinous and somewhat pious, in view of the fundamental conservatism of his general outlook.

V. Shkvarikov (USSR)
Town-planning in Eastern Europe

The speaker began by stressing that proper town-planning could not begin without regional plans for industry, as part of the national economic development plan. One of the basic principles of development in Eastern European countries was to achieve the rapid and even expansion of production, and to site new industries conveniently both in relation to raw materials and to consumers. New communities were being sited in regions where groups of industrial enterprises can best utilize natural and power resources. For example, in Poland, the building of a series of new towns—Nove-Tyhi Piskowitse, Strozek-Radazonkow, and others—in the Upper Silesian coal basin, and equally, the decentralization of the population of the Lodz Region, which over many years had been the centre of concentration of almost the whole of the country's textile industry; in East Germany, Stalinstadt, a town based on a large iron and steel works, and comprising a population of 50,000, with four separate neighbourhoods and a town centre; in Rumania the new towns linked with Jiu Valley coalfield; or, of a different character, the developmet of the High Tatra spa area in Czechoslovakia.

In the USSR before the war, the unrestricted growth of big towns was curtailed by forbidding further industrial construction in Moscow, Leningrad, Kharkov, Rostov, Sverdlovsk, Novosibirsk and other centres. After the war a ban was placed on new industry in all towns with a population over half-a-million. Medium-sized new towns, or local centres, have from 200,000 to 250,000 people (for example, Magnitogorsk, built in 1929).

There are now some 1,300 small towns in the USSR with a population of up to 50,000. It would be expedient to develop new enterprises in a great many of these towns. Satellites of large cities will also be built with populations from 30,000 to 80,000. Such towns will be economic because they "cog in well with the size of most industrial enterprises" and do not need expensive transport systems, or "big municipal structures and so forth." They can have all the requisites for healthy living, but to a certain extent are dependent on big cities for "cultural links."

Shkvarikov then described at some length the reconstruction plans for Warsaw, Stalingrad, Minsk and Moscow.* In the USSR, master plans for the re-development of 300 major cities were now being realized in practice. He quoted, in a friendly way, his Polish colleagues' admission that they had "gone much too far along the path of recreating all destroyed monuments of architecture, sometimes at the expense of impairing living conditions." In preserving historical ensembles they were now following three principles: (*a*) to preserve only buildings of real distinction and to apply modern forms to the rest "observing a corresponding scale"; (*b*) to isolate them from traffic; (*c*) to adapt restored buildings better to the use proposed for them.

In connection with services the speaker described measures being taken against air pollution. More than 160 Soviet towns now had district heating systems. Solid fuel power stations were built outside the towns, but in the next few years more than 500 towns would be receiving gas (piped from underground extraction), and gas "is now overtaking all other forms of fuel." In Eastern Europe, as in the USSR, water supply was a service problem. It was being solved by a series of major engineering undertakings, which would not only provide water supplies for towns, but also irrigate and settle large areas of land including canal transport systems.

Karo Alabian (USSR)
The industrialization of building in the socialist countries

Alabian gave an interesting account of technical developments in the East European countries, and particularly in the USSR. His paper was marred only occasionally—at the beginning and at the end—by passages of self-conscious political propaganda.

In the 10 years, 1946-56, the enormous devastation of the war within the USSR, so far as housing is concerned, has been more than made good. In urban areas some 300,000,000 sq. metres of floor space has been built or rehabilitated,* and in addition, in the countryside, some 5,700,000 individual houses have been built. The number of dwellings is recognized as still very inadequate, and in July, 1957, the Government adopted a programme "to eliminate the housing shortage within the next 10 to 12 years." The number of flats built in urban areas per thousand population has increased from 7 per thousand in 1954 to 10·2 per thousand in 1957. The urban population continues to increase at a very high rate. In 1926 it was 26·3 millions, in 1940 60·6 millions, in 1956 87 milions.

On standard dwellings Alabian said, "Some architects both at home and abroad considered that standardization deprived the architect of creative freedom and failed to satisfy individual requirements. Discussions are still continuing in some countries, such as Sweden, regarding the goals to be pursued: whether it is separate structural elements, flats, staircase-access units or whole buildings that should be standardized. Our experience in the USSR has shown that only the standardization of whole buildings . . . with unified structural elements ensures completion of vast housing programmes in the shortest period. . . ." The series of standard designs are worked out for a period of five to six years. Some 80 to 100 per cent. of urban housing is now carried out according to such standard designs.

In a section on housing, the author gave a number of statistics on the position in most of the East European countries and in China. He concluded that the most common type of urban accommodation is the three- to five-storey staircase-access block of flats, three to four units long, without a lift, and with two to three flats on each landing. "One and a half or two-room flats, with kitchen or kitchen/dining-room are the most common."

* V. Shkvarikov's paper, together with the three volumes of the Congress illustrating the master plans and re-development of cities in Eastern Europe, are well worth borrowing from the RIBA Library, for those specially interested in the subject.

* N. Baranov, in his paper to Congress, stated that this floor space figure represented over 7,000,000 individual dwellings.

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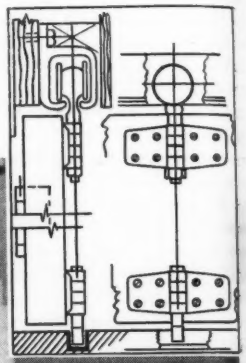
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technical section

THE INDUSTRY

This week Brian Grant reviews a handbook on the 1956 Clean Air Act, and describes a gas cooker, an asphalt design service and a dehumidifying unit.

The Clean Air Act

A new handbook, *A Guide for Industry to the Clean Air Act 1956*, has just been issued by the FBI. This brings up to date the Federation's previous publication on the subject, and includes the regulations which the Minister is empowered to make under the Act. Intended as a working manual for the information of works managers and engineers, the booklet is divided into three sections, how to combat smoke, the control of dust and grit emission, and a third miscellaneous section containing notes on chimney heights, railway engines, ships, steam cranes, and other types of factory producing smokes and vapours not caused by fuel consumption. There are also appendices covering the use of the Ringelmann chart, a description of dust arresting equipment, a list of the relevant statutory instruments, and the names and addresses of the makers of the various types of equipment generally required. The booklet costs 4s. and is an excellent summary for any architect who needs an elementary guide. (*The Federation of British Industries*, 21 *Tothill Street, London, S.W.*1.)

New gas cooker

R. & A. Main have just announced a new medium price cooker called the Centurion, and the illustration provides most of the essential information. The top burners are self-lighting and have press-in safety taps and the now usual pre-set simmering positions. The oven has a drop down door and is vented through the front of the backplate, where it serves to warm plates on either side of the high level grill and at the same time prevents staining of the wall. Below the oven is a storage cupboard. Price is £38 15s. 0d. (*R. & A. Main Limited*, 48, *Grosvenor Gardens, London, S.W.*1.)

Patterns in asphalt

With so many people demanding patterned floors of one kind or another, a new design service provided by Limmer & Trinidad seems likely to be useful. Working in conjunction with the design department, there is also a technical department which will give advice on such questions as underlays and the types of flooring best suited to the conditions, as it should be remembered that Trinidad lay many types of decorative flooring, including Trinascolin linoleum, thermoplastic tiles, rubber, vinyl and cork. While this is not to suggest that architects are not quite capable of producing their own designs, it never does any harm to consult an expert, who will at least be able to recognize the impossible and suggest reasonable modifications. (*The Limmer & Trinidad Lake Asphalt Co. Ltd., Trinidad Lake House*, 232/242 *Vauxhall Bridge Road, London, S.W.*1.)

Humidity control

The Westair dehumidifying unit is put forward as a comparatively cheap method of rendering damp basements dry enough to give reasonable working conditions. The unit is about the size of the average bedside table and is mounted on castors. It is operated from the normal electricity supply, and room air is drawn into the unit by a fan, where it passes over refrigerated coils to condense the moisture, which runs down into a container while the air is blown back into the room. Each unit will deal with rooms up to 2,000 cu. ft. capacity, and in a large room a number of units can be controlled by a humidistat. The makers quote one example from a basement with 85 per cent humidity, and from this 8 pints of water were extracted in 24 hours, reducing the figure to 55 per cent. The illustration shows one of the units in a printer's paper store, where humidity control is of some importance as time may be wasted if the paper has to dry out in the machine room. (*TAF (International), Limited*, 244, *High Holborn, London, W.C.*1.)



The Centurion gas cooker, produced by R. & A. Main, which costs £38 15s.

The Westair dehumidifying unit in a basement paper store.



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technical section

THE REPAIR AND PRESERVATION OF OLD BUILDINGS, 3

job organization

In his third article* Donald Insall discusses the problem of how to choose a contractor (and sub-contractors) for repair work, how to go about getting realistic estimates, and the handling of the job by the architect. In the course of these discussions he points out the need for an RIBA form of contract adapted to this class of work and for a central pooling and publication of repair costs. The section concludes with comments on the drafting of specifications.

Selecting a contractor

The next architectural hurdle to be taken—always the most difficult at the beginning of a job—is, of course, the selection of suitable contractors.

The names of likely firms are usually obtained either (*a*) from personal knowledge of the architect or of his client, (*b*) from trades organizations such as local branches of the NFBTE, or (*c*) by recommendation, *e.g.* of other architects or one of the specialist registers of bodies like the Rural Industries Bureau.

In either case a letter will next be sent to discover whether firms are interested in tendering, and inquiring what jobs of similar character have *recently* been done, and the names of architects from whom references may be obtained. A telephoned personal inquiry will then give a useful quick picture of a firm and its special characteristics and facilities.

The first and most essential criterion is complete reliability, since no matter how brilliant or cheap a firm may be, it is useless if promises cannot be trusted. Given this, the next requirement is a staff of suitable size, and including the right trades for the efficient execution of the particular job in hand. In a really large repair programme, a sizeable firm will have the advantage of being able to draw upon experienced tradesmen in a variety of fields, and upon a variety of plant such as scaffolding from its own yard. But too large an organization will inevitably have a more commercial outlook and less personal interest in the job. It is almost always best to select a firm as small as possible, compatible with the work to be done. An interview on the site will meanwhile quickly enable the architect to gauge whether the local builder is potentially interested in the building as a building, or only the job as a job!

The key man in the whole operation is, of course, the working foreman. It is impossible for the architect to be constantly on the site, and many important decisions in detail must be left to the man on the spot. In the smaller firm of some 20 men, the foreman may himself be one of the principals, fully cognisant with the financial side, as well as with every other aspect of the work. In any event, a high degree of intelligence and initiative will be called for. On the leader's attitude and cheerfulness will depend much of the attitude of the workmen. On a cold afternoon in miserable weather, decaying structure can be a depressing sight; and it is just then that, in the absence of someone really sympathetic to the needs of the job, valuable original work can all too easily be lost.

Is it best to entrust the repair of historic buildings only to contractors with wide experience of this type of job? Obviously where this can be done, and where the firm is really interested, good work is more readily assured. But if only "known" firms are used, the difficulty of finding contractors is greatly intensified, and the incentives of free competition are lost. In special cases such as dry-rot eradication work, a specialist firm's guarantee may be sought. But except for extremely specialized work such as steeplejacking, most building firms of any repute should really be able to tackle the great majority of repair and restoration jobs. Further, it is always an incomparable advantage for an owner to have at hand some local firm with real knowledge of and interest in a building. Maintenance, in a way, can then become something of a "family concern," and a sense of responsibility and security will be encouraged.

Where a firm has had no previous experience of work on old buildings, frequent site visits may at first be necessary; but once the principles of the work are grasped and appreciated, the workmen will enjoy

* Previous articles in this series appeared on Aug. 28 and Sept. 4, 1958.

To protect the valuable interior decorations, a temporary roof was erected over the dome of Kedleston Hall before repair and releading was carried out.





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technical section

their new sense of individuality and craftsmanship. The constructional repair of an old building indeed often provides quite a challenge to present-day skills. The opposite point of view, and one which equally has a place, appears in the formation of direct labour squads, rather on the guild pattern, with local trained craftsmen working together and moving from job to job as a mobile *corps de secours*. Several such units were at work before the war, and the experiment has recently been successfully revived in the Rochester diocese for the repair and maintenance of old churches. There are also individual travelling craftsmen in trades such as roof plumbing, masonry and wood carving, who specialize in work on old buildings, moving around the country and living in close touch with their work. Every effort should clearly be made to encourage this very desirable practice. For personal and family reasons, the arrangement is usually more successful when there is sufficient work of a given trade within a small geographical area. This is not always easy to achieve; and when too long deprived of contact with his fellows, there is also a tendency for the lonely worker to develop a kind of "outcast virtuoso" complex. The guild or group system is generally the best.

For particularly specialist work such as the repair of stained glass, organs, clocks and the like, it is usually necessary to call in a specialist, to be employed under a sub-contract to the main local builder. Registers of craftsmen are maintained by bodies such as the Central Council for the Care of Churches and the Rural Industries Bureau. Is it advisable to sub-contract lead recasting, masonry and similar trades? If the work is sufficiently complex, the equipment and stockyard facilities of a specialist single-trade firm may enable them to quote competitively for this aspect of the work. But the main contractor should also be given a chance of tendering, if he is really capable of the work, if only to avoid any suspicion of partiality on the part of the employer or his architect. In the later stages of a contract, especially when economies are having to be made, it is so often difficult to avoid jealousies, in which the other firm is always the profiteer.

Then there is the question of geographical location. What is a reasonable daily travelling distance? Thirty miles is generally regarded as a maximum radius: but the just-around-the-corner firm has a great advantage. A vanload of highly-paid tradesmen in a traffic-jam is neither productive nor economic. Many firms whose work is widely spread are in fact now maintaining a trained itinerant labour force, who stay on the job during the week. A five-day week would here be reasonable. The cost of accommodation may balance favourably with the cost of travel, when a longer and more undivided day can be worked. Living conditions are important, and somewhere warm, dry and sociable in free time is essential. To meet the lodgings difficulty, many firms are now providing caravans for their operatives. Good living conditions are an essential background to good work.

Clerk of Works

Another question is "Should a Clerk of Works be employed?" The answer must depend on the nature and the extent of the works, and the quality of the contractors. If a really extensive and concentrated programme of work is being undertaken, the Clerk of Works will be invaluable in giving day-to-day decisions in the architect's absence, and in keeping a watching brief over the interests of the owner. But a Clerk of Works, with his accommodation and facilities, is a large bird in the nest. The expense of his retention must clearly be justified in terms of commensurate savings, if this luxury is to be afforded. Generally the smaller or slower job cannot stand the additional overheads, and the whole burden of responsibility and supervision must be shouldered by the architect. The ideal case occurs where, by virtue of a busy maintenance programme on many buildings in a single ownership, an organization can afford to retain a Clerk of Works permanently on its staff. He then, as well as supervising general maintenance works under direct labour, can also be responsible for the daily visit and occasional tricky decision which the smaller job may need.

Enquiries regarding the recruitment of Clerks of Works may be made from the Institute of Clerks of Works*, who maintain a Register of current vacancies. The Institute is an examining body and has recently published a salary scale, recommending graded salaries varying from £700 to £1,300 per annum, depending upon the intricacy and size of the contract. There is no Code of Practice for Clerks of Works; but the Institute has issued a useful summary of duties, setting out the responsibilities which its members are expected to undertake.

Architect and builder

As in all building work, it is always good practice to meet each firm separately on the site before prices are tendered. Special difficulties, such as access for machinery, the disposal of demolition products and the avoiding of disturbance, can then be discussed, and the scope and details of the work clearly understood. The remainder of the tendering process follows the normal pattern, separate dates being allotted for visiting, and the drawings and specifications returned with the tender. Even more than in new buildings, contractors should be made to feel welcome to suggest any variations which their own staffing or special facilities may suggest, and which might have a significant effect on the cost of a job. Secondhand materials or fittings may, for example, be available, and possibly very suitable for re-use in an existing building. Specific dates for the work must be stated or tendered. If identical tenders are received—as not infrequently occurs with cost-plus rates—contractors should be given an equal chance of re-tendering, which gives fair opportunity to a firm particularly keen on the job.

* Institute of Clerks of Works of Great Britain Incorporated, 15 Eldon Street, E.C.2.



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technical section

In notifying the acceptance of a tender to all the contractors, it is usual to give the figures; and any proviso such as the obtaining of Improvement Grants should always be mentioned. It is too often forgotten that a contractor takes much unpaid trouble over a tender; and it is only fair that he should be promptly and properly thanked for his work.

Where the fixed-price contract is adopted, it is, of course, notorious that any "extras" are always more expensive than work originally tendered for; and in compiling the bills for this type of contract, the greatest care must be taken to check and countercheck the inclusion of every item which is likely to be needed.

Phasing of work

Where for reasons of urgency part of the work must start immediately, it is often possible to divide the job into more than one contract, competitive tenders being obtained for each in turn. The preliminary contract can, for example, deal with demolition and site clearance and the salvaging of useful materials, while that for the main work is still being negotiated. Even this cannot be done efficiently until a fairly clear idea is obtained of the eventual programme; and great care is needed to prevent overlapping, or the inclusion in earlier contracts of work which may later have to be altered or undone. Really urgent work, such as the repair of a fast-leaking roof, or the eradication of dry rot, often cannot wait for quantities and must be done under the best daywork rates negotiable. But, usually, the reinstatement of finishes is then easy to measure, and is best taken to tender.

In general, despite the demoralizing effect of the mounting spiral of wages and materials costs, it is always an economy to avoid rushing into bricks and mortar until the ultimate scope of works has been decided in detail. Conversion work demands the most careful planning, and cannot be properly done in haste.

The form of contract

What actual form of contract should be signed? The old RIBA "Forms of Prime Cost Contract for Use in the Repair of War Damaged Property," issued in 1946, are still in use and were revised in 1956. One of them (yellow) provides for the cost plus fixed fee, and the other (green) for the cost plus percentage contract. It is perhaps unfortunate that at least the out-of-date title should survive when, despite the profession's natural preference for the firmly priced contract in new work, there is so much repair and maintenance work in which a cost plus contract is so essential. The fixed fee form may sometimes be useful in offering an incentive to keep within a fixed contract total. The RIBA "Standard Form of Contract" (with or without Quantities) may alternatively be adapted to serve a cost plus contract, and is useful when the main contract is on a cost plus basis, while containing substantial sub-contracts on fixed prices.

Ideally, none of the three RIBA forms is entirely suitable, as it stands, for the type of day-work job normally encountered in old buildings work. The *Prime Cost War Damage Forms* are valuable in dealing fully with the financial aspects of an agreement, although they may have to be suitably amended to include the actual rates negotiated with a contractor. In comparison with the Standard Form, however, they deal quite sketchily with many important requirements relating to the actual management of the job. For example, "Architect's Instructions" are not defined, and the contractor is placed under no liability to confirm them. Nominated sub-contractors and suppliers also receive scant treatment, and the necessity for insurance of the former is barely mentioned. No clause requires the contractor to deal with notices and fees or to indulge in a foreman or put up with a clerk of works. The *Standard Form*, in its turn, whilst dealing very thoroughly with all the procedural items and providing for fixed price sub-contracts, requires much tedious ink-work to adapt it to the cost plus contract. An official Institute form carefully matched to the needs of the cost plus maintenance contract would be of the greatest service.

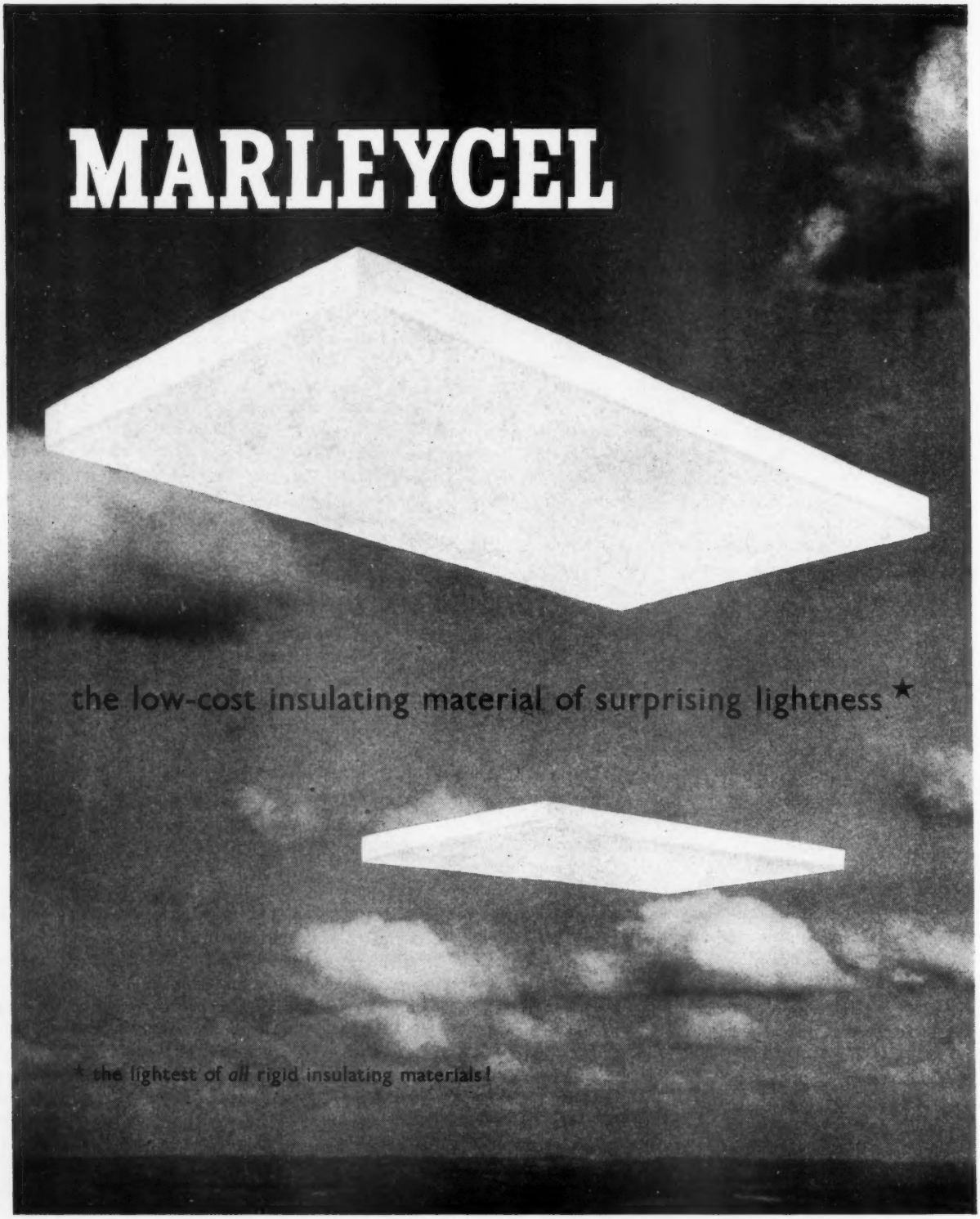
Should the client be a Government department such as the Ministry of Works, the RIBA form is replaced by special Ministry forms; and payment is authorized by Ministry certificates and by the signature of the nominated architect (defined as the "supervising officer") to the contractor's daywork returns.

Control of cost

Detailed daywork sheets provide a mine of information about the work—and the workmen—and it is the architect's duty not only to check the figures, but by analysing the sheets to find out exactly what is going on.

Throughout any job, it is important to keep the client properly informed of financial progress, not only in terms of money spent but of up-to-date estimates of future expenditure. When there is a fixed budget, arrangements can be made for the most important or difficult works first, and if necessary for compensating the estimates as work proceeds by less important omissions from the initial programme. In old buildings work, the greatest problem is always "to know just where to stop." Strict control within fixed ceiling price, containing a reasonably generous contingencies allowance, presents the firmest defence available against a sea of rising costs.

In practice, the contract figure is much more easily enforced than the time allowance. The "penalties clause" for non-completion, always a difficult one, is virtually impossible to enforce, owing to the constant occurrence of the expected but unforeseeable problems and difficulties which inevitably arise—perhaps more in old buildings work than in any other—and can always be quoted against it. One minor remedy in these days is the deletion of the price fluctuations clause, so that the threat of rising wages becomes some small incentive to early completion: but this is only applicable to fixed-price jobs, and can only be



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technical section

a very minor bargaining-point.

The estimating and contract side of old buildings work is so much a matter of experience, and life is so short, that it does seem a pity that the practical experience of the profession in this respect cannot in some way be more effectively pooled. Careful analytical study of the up-to-date comparative costs of such jobs as the re-laying of lead or copper on roofs (*e.g.*, recasting leadwork, is currently costing 10s. to 15s., and renewal of copper 7s. to 8s. per sq. ft., but any figures need far finer description and analysis) would be of value to everyone. There should be little difficulty in maintaining an index of current repair and maintenance prices for the most repetitive jobs and typical trades, in terms of unit rates. Such an analysis would be of the greatest possible value both to individual architects, many of whom may receive only the occasional large repair job on which to judge other estimates, and also in the much greater problem of assessing the cost of repairs for the nation.

Site organization and control

In the early stages of any job, but particularly where an occupied existing building is concerned, there is a great deal of preliminary organization detail to be agreed on the site by the architect; and in this respect there is no substitute for frequent personal visits to the site.

It is, however, important to consider which points are the architect's responsibility, and which will be left to the contractor. The architect's first concern will be with the convenience of his client and the scope and quality of the work in progress. The contractor is a specialist in organizing building operations, with regard to maximum efficiency and economy. Between them, and with the quantity surveyor if there is one, the two form a working team, each accepting certain responsibilities. In this there is a distinction between the new building and the repair job. In the new building, the contractor tenders against measured quantities of labour and materials of a specified standard: and the architect's main duty is to ensure that these are supplied. In repair work, on-the-spot decisions must be given regarding the work as it develops; and it is the architect's job to give technical advice, to see fair play and to ensure good work. Again, a distinction must be drawn between the fixed price contract and the cost plus or direct labour job.

A builder who has undertaken to complete specified work at a fixed price will wish to carry the entire responsibility for organizing the work in the most efficient and economical manner. The architect need then satisfy himself only that his specification is complete, and that the order of work is in the best interests of the building and of his client. But with work on a time-and-materials basis, where there is no financial incentive to the builder to economize, the architect must himself ensure that the work is being carried out in the most expeditious way; and it is his business to assist with the actual organization of the job.

In either case, the terms of the contract and specification must make it entirely clear at whose door each responsibility lies. There are, in effect, three spheres of responsibility. It should not be necessary for the architect to inquire about such items as workmen's insurances, which are entirely the concern of the contractor. The responsibility for fire precautions and for all protection and shoring must also rest with the contractor: but since neither insurance repayments nor the contractor's reinstatement can replace an old building, the architect will wish to assure himself that every proper care is in fact being taken.

Insurances against possible fire and theft in an existing building are the responsibility of the employer; but it is the architect's duty to make sure this is fully appreciated, and clearly stated in the contract.

The first point to be settled on the site is the question of site facilities for workmen. In an occupied building, the architect must make sure that the minimum of disturbance will be caused thereby to his client. Permanent or temporary latrines and their siting will be agreed, and possibly a site office and telephone arranged. A supply of water and possibly a gas ring below stairs will be earmarked for the contractor. Access routes to all parts of the work will be agreed and, if possible, reserved for his use and control. Storage facilities under lock and key are extremely useful, and should particularly be allocated when valuable materials such as old leadwork are on site: in an inhabited building, the key to this can well be in the charge of the owner. On a deserted site or an empty building in built-up areas, it may be an economy for the contractor to engage a night-watchman: if irreplaceable old work is endangered, the architect may wish to insist on this as a condition of contract.

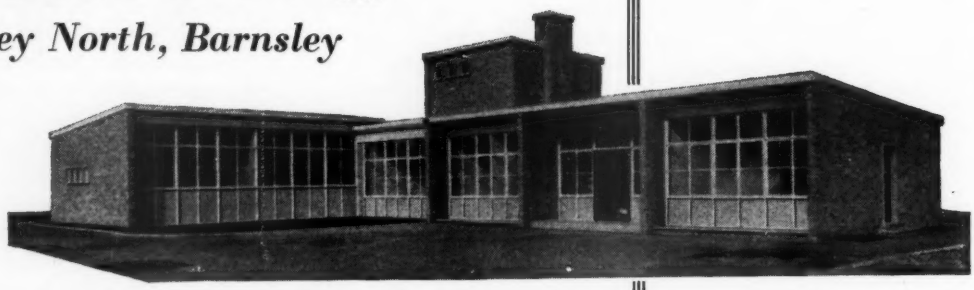
In work on occupied buildings, it is more than ever essential for the contractor to maintain a close co-operation with the owner and occupiers. Building work is dirty and tiresome to the house-proud; and plaster dust finds its way through every crack and crevice in the most unbelievable way. Building equipment must be kept out of harm's way, and paths kept clear for tradesmen and family visitors. Poisonous chemicals and vapours must be kept away from foodstuffs, and diplomatic relations maintained with the children and even the household pets. Most building occupants, however, are only too willing to help with facilities for preparing tea and the like, and to take an interest in the comfort of the workmen. Indeed for all the difficulties, it will often prove that work in an inhabited building is very much more amenable than in a gaunt and deserted one.

Shoring and protection are the legal responsibility of the contractor: but the architect must ensure that the maximum care is taken of an old building. Features such as valuable old stained glass and statuary are often irreplaceable, and must be carefully shielded from harm by stretched tarpaulins, close boarding or

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technical section

by padding with sacks of straw. Vulnerable materials such as roof leadwork must be protected from damage by nailed boots and dropped tools, and here again close boarding is the best defence. Adequate and inexpensive shoring may call for a good deal of resourcefulness. Quite light structures of boarding and wire ropes can be of great value, if only they are in exactly the right place. A firm frame of struts must somehow be contrived to give the maximum support, either from the ground or from firmer parts of the structure. If the shoring is efficiently designed on a triangulated system, the joints can be merely pinned like Meccano; or modern tubular scaffolding may be used. When the two faces of a wall have become dissociated, it will, however, be necessary to provide continuous support by means such as close boarding on one or both faces of the damaged area. In general, it is always wise for shoring to err on the side of over-generosity, for prevention is the only possible cure.

In an existing old building, it is essential that the contractor should be taking extreme care against all possibility of fire. Firstly, the local Fire Officer should be contacted: he is always glad to advise without charge on the fire risks and fire-fighting provisions which should be made. Whatever extinguishers and equipment are recommended should be constantly in good repair, and "at the ready." Workmen must be trained not to throw matches about; and when particularly valuable work is concerned, or where flammable insecticides are being used, it may be necessary to ban smoking altogether. It must be made someone's responsibility to ensure that everything is in order every time the site is left for the night. It is impossible to be too careful: Coleshill was lost to a small blowlamp—and what is gone is lost for ever.

In cost plus or direct labour contracts, the architect will interest himself in matters which are normally the contractor's sole concern. The actual programming of the work can make the greatest difference to its ultimate cost, and the extent and utilization of plant are worth careful thought.

If electric light is eventually to be installed, it is always an advantage to take the opportunity of providing the service at the outset. Adequate light is invaluable: it is impossible to do good work under dim lighting, and what may at first appear to be a positive profligacy in this direction will be found to repay handsomely in terms of time saved and quality of work. Electric hand-tools can save a great deal of time, and may sometimes be the only means of reaching inaccessible corners.

Use of scaffolding

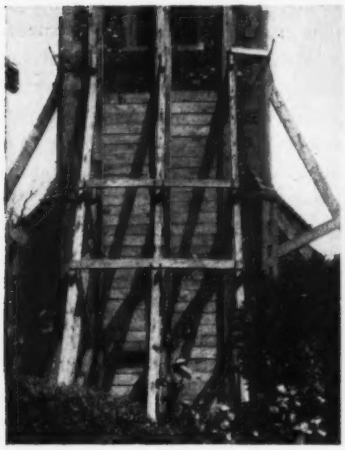
Another decision will be whether or not to use scaffolding. Again, while not cheap, this does enable such savings in time and labour that it is usually worth while, especially where any heavy work is concerned. The general contractor may possess or hire his own scaffolding, or a specialist subcontractor can be invited to do the job. In the latter case, although the scaffolding will be erected with astonishing speed, some form of understanding is needed regarding minor alterations once it is in place. These may be frequent, and should not have to wait for a specialist visit, when much time can be wasted. Scaffolding contractors are naturally anxious to guard their responsibilities regarding extensive alterations; but it should be possible to reach agreement on this point. The scaffolding may be erected in slightly higher stages than are usual in new building; and care must be taken to avoid damage by the movement of loose members, or chafing of ropes during the work, and especially during the delivery and dismantling of scaffolding. Where very extensive scaffolding is employed, it may be an economy to speed up the programme of work in view of the reduction in charges. Another device worth considering in roof repairs is the temporary cover roof. Constructed of tubular scaffolding or timber framing, and covered in corrugated iron or perspex, this obviates the need for tarpaulins and provides free access to the whole of a roof for uninterrupted work. When serious and expensive harm might otherwise be caused to internal finishes by rainwater, the cost of the added security and convenience is amply repaid. Two disadvantages should be mentioned: in summer, a cover roof is hot, and may make the use of insecticides uncomfortable; and in winter, care must be taken to prevent the whole roof acting as a sail and "taking off," with possibly disastrous results. Sometimes, only a part of the cover roof need be used at a time: the disposal of rainwater must then be carefully arranged, during any periods while normal roof gutters are temporarily out of service.

The safety of his workmen is a paramount concern for the contractor—or in direct labour work, for the employer and his architect. All ladders must be properly tied for safety, as well as being padded to avoid damage to the building. Aluminium ladders, owing to their springiness and sharp ends, can mark stonework quite seriously if not protected; the rubber end chocks sometimes fitted are slippery in wet weather. Wooden ladders *must* be left unpainted, so that cracks can be readily seen. Access and scaffolding boards "walk" unless they are properly tied, and may easily provide dangerous traps and see-saws. Except in extreme circumstances, the use of lifts and hoists should be rigorously restricted to materials. There is no excuse for risking the lives of workmen.

Every precaution must, of course, be taken by the contractor to preclude danger or nuisance to the public and others, including any unwitting occupants of buildings who may thoughtlessly open windows in dangerous positions. Adequate close-boarded platforms and tarpaulins are necessary to prevent danger from flying chips and dropped tools. Proper warning notices are required by law, as are red warning lamps at night time on scaffoldings in any public way.

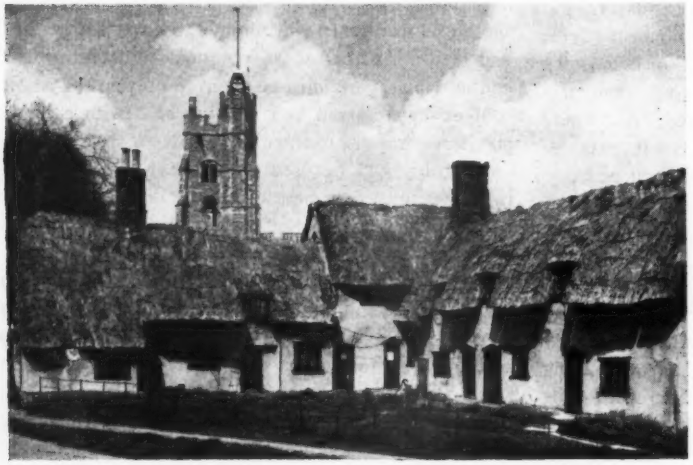
Everything possible should be done to encourage the co-operation of the individual workman. The personal

technical section





Above left, firm shoring and continuous support by means of close boarding used to support bulging flint walling. Rede church tower, Suffolk. (Architect, Marshall Sisson) Above right, Westminster Abbey. The cleaning of interior stonework with pumice dust and a very limited amount of water—to avoid damage to furniture and fittings. (Architect, S. E. Dykes Bower).



Cottages at Cavendish, Suffolk, before and after repair. (Architect, John Macgregor).



interest of the owner and his architect in the way the work is done, and their sympathy with the difficulties and achievements of the job, are the workman's rightful due, and will be reflected in the quality of every detail. The architect, as well as the foreman, should know the names and skills of every specialist in the team. In the vast new building, this is impossible, but in the repair of a historic building, it is essential.

From the point of view of the architect's office arrangements, preservation work is broadly similar to new building. More site visiting is involved, and all instructions must of course as soon as possible be confirmed in writing. Sketch drawings and details are often more conveniently made on the site, and these and handwritten notes agreed with the foreman at the time of visiting are perfectly adequate if a carbon copy is kept for filing purposes.

Drawings, correspondence, and certificates

Although frequent and observant site visits are of more importance in old buildings work than chests full of drawings, a thorough survey-drawing is always worth the effort. Where conversion work is not extensive, the same survey negative may often later be adapted as a working drawing, if sufficient prints have first been taken off for all needs. Pencil tracings are easily altered but far less clear than ink negatives. Ink drawings may well be freehand and, if on heavy tracing paper, can be altered repeatedly without suffering overmuch. Another method of quickly revising a drawing is to obtain a true-to-scale print on tracing paper, from which unwanted detail can be deleted by the printer: the new negative can then be completed and printed with little loss of quality. The linen negative is rarely justified, except where great permanence is required; but the print on opaque linen is, of course, the best of all. True-to-scale prints cost little more than dyelines, and give excellent service on the site. It is often convenient for drawings to be kept to a small and standard size such as a multiple of foolscap, when they may be bound together with a Specification or Bill of Quantities. Drawings coloured to represent materials are always much easier to read than those with only varied hatching; and colouring, where not required as legal evidence, is much quicker and cleaner in crayon than in water colour.

Site drawings are required to withstand rough usage, and should be clear and bold. Every essential dimension must be shown, so that nothing need be scaled from the drawing. To facilitate setting-out from an existing building, dimensions should always be shown from points which will remain, *after* preliminary demolition work has been done. Hidden features such as damp-proof courses, cramps, and supports must be clearly noted and indicated in writing; and explanatory border sketches and notes are often useful. Chalk is useful on site visits, when quick sketches may usefully be made "on the wall." If schedules are needed, these may be typed but are more easily copied, amended and kept up to date if handwritten on heavy tracing paper and printed. Extra copies of elaborate

typed material can quickly also be printed if an extra carbon has been typed on tracing paper.

Correspondence, certificates and accounts follow the usual pattern, except that it is always wise in cost-plus work to require an up-to-date forecast of future costs, as well as full details of past expenditure, from the contractor with each certificate application.

In the last stages of any job, a good deal of enthusiasm is needed to ensure that the interest of all concerned does not flag, and that every detail is properly carried to conclusion. When everything is finally completed, the contractor appreciates the personal thanks of an owner, as well as of the architect, on the dissolution of the team. Maintenance period inspections are made in due course, the usual period being six months from actual completion: in high quality work, twelve months is quite reasonable to ask. A large organisation may sometimes require to pay the contractor's accounts before the full maintenance period is complete, so as to allow settlement within a certain fiscal year. The contractor is usually in this case glad to accept settlement without prejudice to the correction of any little subsequent teething troubles requiring remedy; but in the normal event with a private client, the retention fund is a necessary security for the owner, and an incentive to the contractor to complete the fiddlesome list of minor repairs.

Professional fees for conservation work are in accordance with the RIBA scale, under which up to twice the normal percentage for new work may be charged for alteration jobs involving an existing building: many architects charge a standard flat rate of 10 per cent. and expenses for all old buildings work, plus a small charge for survey drawings where these do not already exist. A half or full-day visit and subsequent detailed report will usually at present cost seven to ten guineas, plus travelling and incidental expenses. It will be seen that, however interesting for the architect, conservation and alteration work is certainly not in the same financial field as the design of some types of new building; and on the smaller jobs, when Improvement Grant applications and the like are entailed, the profit margin is often extremely slight. But old buildings are commonly set in a magnificent environment, with interesting owners, and one's work can sometimes be one's pleasure too.

Specifications for repair work

The preliminaries of a repair specification should make particularly clear the responsibilities of the employer and contractor concerning insurance and the protection of the structure and personnel, and all arrangements made for the mutual convenience of contractors and occupiers. Typical clauses are suggested in the appendix to this section. On the other hand, it is all too easy, by providing in the preliminary clauses for every possible contingency from treasure trove to the disposal of uncovered human remains, to convey a vastly inflated idea of the complexity of the job. In a working specification, it is necessary only to be realistic and crystal-clear about reasonably likely day-to-day hazards. In repair work, the specification is generally intended mostly for the guidance of the site foreman; and it should for this reason repeat any instructions already contained within the Form of Contract which the foreman will need to know.

In proceeding to the detailed instructions, it is important to give full information, but without repetition and confusion. If fair competition is intended, it is difficult to be too exact in stating the requirements: but confusing demands and stipulations can only result in inflated estimates.

Whereas in new work and for taking-off Bills of Quantities, a grouping of works under trades is preferred, there is no doubt that in old buildings, the most convenient way is to set out the works on a room-by-room basis. The interrelation and extent of works can then be readily grasped " at a glance " on the site. If a pricing column is added throughout the specification, individual costs can also be entered against each item, which is generally in practice the most useful arrangement for all concerned.

Everything should as far as possible be specified in its natural building order: thus protection and shoring are first described in detail, followed by demolition and removal, and then new work. With each item, materials, construction and finishes should be noted, together with their relationship with the existing. Disposal instructions and credits for fittings, etc., removed must be clearly given. In phrasing individual sentences, it is always clearest to work from the whole to the part. Poor specifications abound in such phrases as " Fix salvaged basin taken down as elsewhere specified on east wall, and shorten or lengthen hot and cold pipes and waste branches, all as necessary," and " Hang old re-used door from pantry in 4 in. × 1½ in. frame in new opening in north wall with 6 in. × 3 in. lintel over." It would have been more helpful to say, " Turn off hot and cold mains, disconnect plumbing, remove and re-fix lavatory basin in new position on east wall; adapt and re-connect hot and cold water supplies and waste branch," and " In north wall, insert 6 in. × 3 in. lintel and cut away to form new doorway opening; line with 4 in. × 1½ in. rebated deal frame, primed for painting, to receive salvaged door from pantry." Then the foreman knows just where he is, and with the least possible fuss. The word " existing " should be retained for parts of the building which will remain existing after alteration—" disused " or " previous " or " demolished " is otherwise less misleading for everyone.

The extent of detailed direction which the architect will wish to give, and conversely of initiative in dealing with day-to-day problems which the foreman is required to display, must somehow clearly be conveyed by the terms of the specification. Where work must be inspected before it is covered, this should be clearly laid down. Where samples of materials are to be approved, or qualities and colours selected, the specification must make this entirely clear.

technical section

Appendix: some typical general clauses useful in specifying repair work

Repair specification: general

CONTRACTORS AND SUB-CONTRACTORS: The whole of the work, including specialist sub-contracts to be carried out by nominated sub-contractors, is to be undertaken as the responsibility of the main contractor, Messrs. ——— ———. The main contractor shall be responsible for synchronizing the work of all sub-contractors in such a way that the whole of the work is executed in the best, most efficient and expeditious manner.

PROTECTION: This house is of great architectural importance, and contains decorations and furnishings of the utmost value. It is essential, therefore, that the greatest possible care will be taken throughout the repair works to eliminate every possibility of damage to the fabric and contents from any cause whatsoever. Particular care will be necessary to avoid all accidental damage to original window glazing, by means of careful close screening and protection.

The contractor shall be responsible for arranging with the owner's agents for the removal, storage and replacement of all articles which would otherwise be exposed in any way to damage, and must ensure that this has been done before the relevant work is commenced.

The contractor is to provide and maintain, throughout the whole period of the works, all necessary supports, shores, hoardings, etc., necessary for the complete protection of the building, its decorations, contents and furnishings, and all persons from all harm whatsoever arising from the works, and is to be responsible for the complete repair at his own expense of all damage occasioned at any time during the progress of the work.

The contractor shall similarly throughout take all reasonable precautions to avoid damage to the adjoining properties and public or private roadways, to be made good promptly at his own expense.

RUBBISH: The building will remain inhabited, and every effort is to be made to reduce mess and disturbance to a minimum. All materials and equipment are to be inconspicuously stored and all rubbish cleared away at intervals, the building and environs being kept as clean and tidy as possible.

SCAFFOLDING: All scaffolding is to be erected, securely constructed, maintained and carefully dismantled so as to avoid all damage whatsoever to the building, its decorations, contents and furnishings.

SALVAGE: Appropriate credits are to be allowed for all re-usable or saleable materials and fittings removed from the site; and all other salvaged items are to be stored as directed.

No salvaged materials whatsoever shall be taken from the site without written consent. Proper weighbridge certificates, witnessed by a representative of the estate staff, shall be obtained for all old lead removed, for credits at rates to be negotiated.

ACCESS: All parts of the site and buildings except those immediately under repair are to be out of bounds to all operatives. Access routes to roofs and all other repair works are to be strictly as agreed with the architect. All external doors are to be locked nightly.

The contractor will be responsible for keeping all persons under his control, including men employed by sub-contractors and all unauthorized persons within bounds, and will be liable for all damage for adjoining premises and property, estate roads and planting and vegetation, by lorries, workmen or any cause. Any damage occasioned shall be made good at the contractor's own cost.

FIRE PRECAUTIONS: Although insurance can cover financial loss, it cannot replace an historic building. Fully adequate fire protection is therefore to be discussed and agreed with the local Fire Officer and maintained throughout the works by the provision of plentiful hoses, fire extinguishers, and other equipment sufficient for any emergency which might arise. No smoking whatever shall be allowed in any building; and any operative not complying with this requirement shall be instantly dismissed. Extreme care must be taken with blowlamps and similar apparatus, and when using flammable materials.

PROGRESS CHART: The contractor shall within four weeks of the date of the order to commence operations produce in agreement with the architect a detailed programme chart of the whole of the works, to be followed in their subsequent execution. One copy shall be forwarded to the architect and one maintained on site and kept up to date by the regular recording of progress. All modifications subsequently found necessary shall be discussed and agreed with the architect.*

PROGRAMMING: Dates of commencement and completion of each part of the work together with all anticipated disturbances or requirements shall be notified in advance to the architect in sufficient time for agreement with the owner or his agent. The work shall be so arranged as to allow the most efficient use of equipment and interrelation of trades, for the best quality work, and with a minimum of nuisance to occupants and visitors.

PAYMENT: Fixed prices shall be negotiated for all measurable parts of the work; and in the absence of agreement, the employer reserves the right to obtain competitive estimates. Payment for all other work shall be based upon the contracted Schedule of Rates.

All daywork sheets, vouchers, receipts, weighbridge dockets and other records of time and materials spent and recovered throughout the works are to be submitted for inspection by the architect and/or surveyor with each certificate application, and no claim for payment will be entertained unless properly so substantiated. The contractor shall at the same time also render up-to-date itemized and detailed forecasts of future costs estimated for the whole of the remainder of the work, to include all contingencies. This is of the utmost importance as the total expenditure cannot be increased, and must throughout be regulated accordingly.

* Applicable where extreme care is necessary.

technical section

7 PRACTICE

teamwork on housing projects

the management consultant

The author of this week's article is a Dutch management consultant F. J. Hulshoff Pol, originally trained as an architect. He follows the article by H. K. Duhoux published in the JOURNAL for August 21 on housing in Rotterdam with a description of the management consultant's work in organizing teams of architect, engineer and builder. He stresses the human problems of teamwork and the need to avoid over elaborate programming.

Though in our country much has been done, after the second world war, about the development of rational building methods, the increase in productivity in the building industry is, on the whole, not yet impressive. We only need to point here to the always fluctuating market position, to the historically grown relationships and to the enormous "red-tapeism" since the war, as a result of numerous regulations issued by the authorities. These factors and the dispersed control of traditional procedures induced the Rotterdam Housing Authority to create production teams at about the same time as the LCC constituted a team for Picton Street. Rotterdam, however, went further than London, by making the production teams responsible for continuous housing production, too.

Various traditions had to be broken through. This was particularly true of the contractor's position, because the normal procedure of letting out works by contract could not be followed. Other guarantees for a right choice had to be created. A previous investigation of the contractor's business, and a method of determining the contract price appeared to be necessary. Hhis problem has not yet been solved satisfactorily; there is need for an independent quantity surveyor as in England.

The production team

In his article Mr. Duhoux has already given some information about the proceedings of a team, but the following additional remarks can be made:

The contractor is not eligible to be team manager. A contractor, team member, expressed this as follows: "During the preparation I am an adviser, during the execution I am no longer free, for then I have to look after the interests of my business, too."

All the members of the team are responsible for their own part. The following example may illustrate this. During the execution of one of the projects it turned out that an error had been made in the design. At a team meeting this error was discussed. The architect defended himself by saying: "The whole team is responsible for this; you have all overlooked the error." This remark was not correct; a car driver committing an offence may just as well argue that his passengers are co-responsible because they did not warn him, but the law rightly holds him responsible. All the team members should have power to make decisions. Occasions have not been wanting when a partner sent to the meetings a representative who made certain promises that were taken back later on. It is quite understandable that this should have a disturbing effect. A representative should be empowered to make decisions.

Immediately after each meeting, the team secretary should draw up a list of the arrangements and decisions made and furnish it at once to all the partners. At the opening of the next meeting this list should be checked. Such a list of arrangements (see Fig. 1) is a simple but very efficient means to remind all the partners of their commitments. The usual minutes are mostly too long and usually ready much too late. Before each meeting the secretary, and team manager, should carefully prepare an agenda. Beforehand, the secretary has to inquire of the team members what items they wish to discuss. The manager decides which items should be considered at the meeting and which can be arranged among the members. A survey of the progress of the project is added to the agenda. For the rest a number of principles for good discussion are applicable for all the partners, such as: Keep to the point, listen, do not be personal, everyone in his turn, make constructive criticism.

List of arrangements

Intended for	*Description*	*Planned date*	*Remarks*
Mr. I Mr. S.	Complete specifications for delivery to partners	26-4-'58	
Mr. W Mr. E	Estimating exact quantities for sheds	26-4-'58	
Mr. I	Sending bill of quantities	3-5-'58	
Mr. O	Report to the Town-Council on the tender-procedure	29-4-'58	
Mr. T	Overall plan	26-4-'58	

Next meeting at: Monday, May 12, 1958

Fig. 1. The kind of decisions (and dates) recorded at a team meeting and circulated soon after the meeting, to all team members. Elaborate and lengthy minutes were avoided, and matters which could be agreed directly between team members were not discussed at team meetings.

technical section



Fig. 2. Co-operation of other kinds takes place in Rotterdam. This shopping street Lijnbaan, was designed by van den Broek and Bakema for a group of 75 retailers.

It is the task of the team manager to draw conclusions after discussion.

The team partner's time is valuable, therefore matters that may be arranged among the partners should not be brought before the team. It not infrequently happens that purely technical affairs, that concern only a few partners, are discussed in detail. This should be avoided. But a report has to be made to the team on what has been arranged among the members. The subjects to be considered are according to the production team's purpose but two aspects can be distinguished, namely: *the "organizability" of the project* and *the co-ordination of all activities.*

"Organizability"

At the outset, it was the co-ordination that the team partners were interested in. But as a more clear grasp was obtained, more and more attention was paid to the organizability of the project.

The kinds of question considered were: Is there much variation in the length of the housing blocks? Are there unprofitably long or short blocks? Can the housing blocks be subdivided into equal units?

Is a restriction possible on great diversity of housing types? Is each type being produced in the right numbers for efficiency?

Is the housing type suitable for serial production or has the type an intricate ground plan, offering difficulties to a standardization of building parts? Are there, in view of the location of the supporting walls, large span lengths of support?

Are there any hampering constructions in the places where prefabricated parts are to be used? (For instance, balconies that must be cast on the spot, when applying a prefabricated floor system.)

Has allowance been made for the dimensions of the parts when fixing the main dimensions?

Are there any types of construction that are difficult to carry out?

Has allowance been made for access for maintenance?

What are the costs of different components and materials?

Is there a possibility of combining fitted basins, toilets, showers, etc., and smoke and ventilation ducts?

An example of the result of these questions concerns an original project consisting of 727 houses com-

technical section

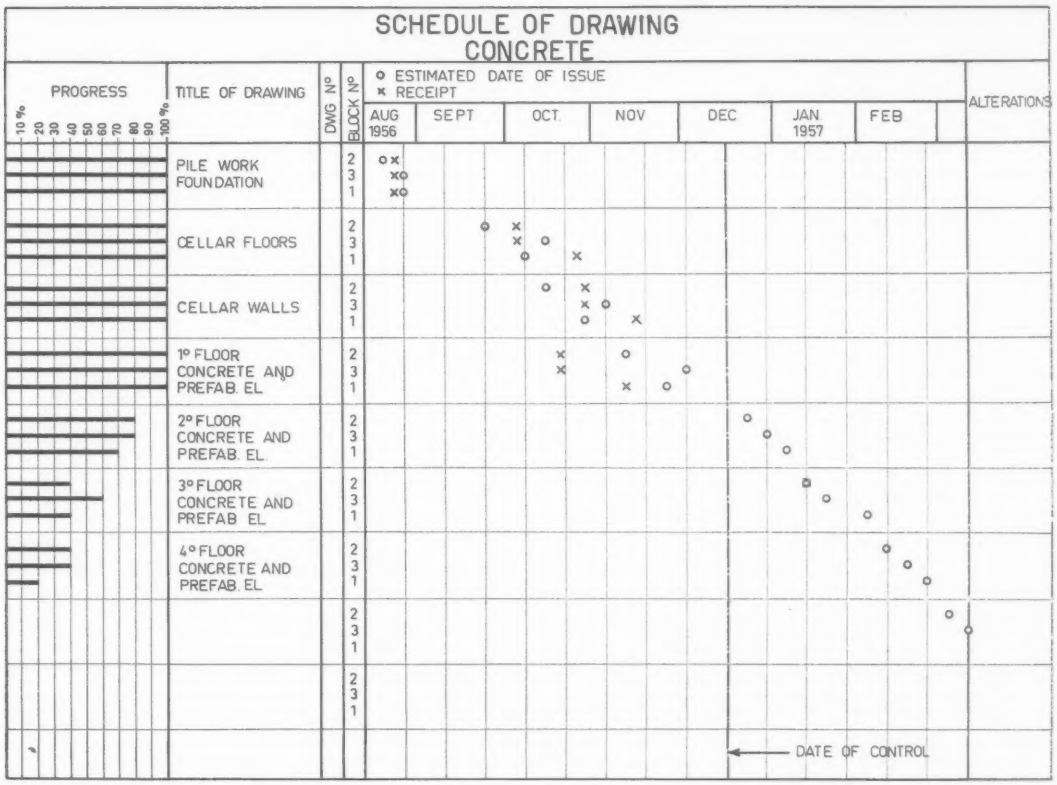


Fig. 3. Part of a drawing office programme for the concrete designer, based on a form originally designed by Stone and Webster in America. Notice that the left-hand column enables percentage completion of each drawing to be marked up at regular intervals.

posed of 15 different types of housing blocks. When, in the team, the attention of the town architect had been called to the organizing problems attached to the execution of that plan, the latter designed a new plan with only five housing types. This went far to meet the possibility of a right organizing framework for the execution, assuring a large measure of continuity. In addition, this plan had the advantage that 747 houses, that is, 20 more houses, could be put on the same site and the initial cost per house reduced. It could be said that the contractor is there to answer the many questions of cost and organizability. But the contractor mostly only sees the "case," whereas the management consultant looks for the "phenomenon." An example may illustrate this: For a certain project a building crane had to be used for putting a few heavy front beams into place. The contractor accepted this solution. The management consultant, however, stated that the crane would be productive during a small part of the building period only. He asked himself: "Is there another solution to be found for those heavy beams? If so, no crane is needed. If not, would it not be possible to use prefabricated parts to a greater extent, so that the useful effect of the crane may be increased?"

The question will be asked: how is the architect reacting to the interference in "his" design?

Of course, in camera, there have occasionally been some harsh words on both sides, but those were exceptions. It is really surprising to notice—and this is an important profit item as well—that various architects, including town architects, came along of their own accord, with the question: "Can you organization experts give a number of directions for good organizability that we can take into account, if possible, for future cases?"

More important than immediate results is the fact that the views of all parties on the possibilities of organization have been deepened, they have become more organization-minded and so future jobs, in their turn, will take a shorter preparatory period and will be carried out in a more rational way.

Co-ordination

The success of working in a team system is also dependent on the way in which the phases of preparation and execution and the activities of the team partners are connected together. Planning and progress control are essential to this. The idea of "planning" is not new. Prominent enterprises mostly have a planning department already. However, a contractor can only plan his own part in the realization of a building project. With the traditional procedure, the only thing

technical section

he can do, is to hope that, for instance, the sub-contractors also have a plan, that is in agreement with his own. It mostly appears that this is not the case. When planning for working in a team system, the first important thing is the co-ordination and integration of the individual planning activities of the partners. It is important not to plan too elaborately at the outset otherwise presumptions and wishes are anticipated that cannot be realized later on. Planning has to go by various stages from coarse to fine. This is particularly true for the planning of the work of contractors, sub-contractors and specialist firms.

The overall plan which broadly fixes the time required for the operations of the team partners and especially the dates on which they must have finished these operations. From the final date, calculations are made backwards—the planning is made from finish to start, and not the other way round. The overall plan is drawn up by the organization expert, after consultation with the partners.

The decision on this plan is taken at the team meeting. In his article Mr. Duhoux gave an example of an overall plan for the first project of the Rotterdam team 2 (see AJ, August 21).

Part plans include the schedules for the operations of the partners individually. These may be the plans for making the site ready for development, for the drawing offices of architect and designer and the rough time schedules for the execution. Each partner should prepare his own plan, assisted by the management consultant if necessary. The management consultant has the duty of verifying whether the separate plans and schedules are in agreement with the overall plan. An example of a part of the drawing schedule for the concrete designer is given in Fig. 3.

At first it took some doing to have the partners draw up part plans. For making the sites ready for development it was thought sufficient to assure that the operations should be finished on the appointed date. This was rightly not accepted by the team, because this would make it impossible to verify whether in the meantime difficulties had arisen, that made the promises impossible.

At first the designing offices held the opinion that drawing work could not be planned. It appeared, nevertheless, that at the drawing office, especially when making details, there was much routine work that could be planned very well. It is not so much an exact fixation of time for each drawing as a *right sequence* that is important.

When the execution comes near, the contractor has to complete his time schedule by a number of usual planning documents of which the principal is: A plan for the arrangements of the building site, if necessary a plan for the rotation of the formwork and the like.

Fig. 4. A weekly programme for the work on site of 2 gangs. The horizontal columns marked P show the planned sequence and the columns A what actually happened. A short term programme like this would be prepared only 2 or 3 weeks before it was actually carried out.

WEEKLY PROGRAM

Week 43		Tuesday 28/5	Wednesday 29/5	Thursday 30/5	Friday 31/5	Saturday 1/6	Monday 3/6
Pouring Concrete	P		Block 8 - 2nd floor	Block 18-cellarfloor	Block 18-cellarfloor	Block 11-1st floor	Block 11-1st floor Block 9 - roof
Gang I	A	Block 3 - 4th floor	Block 8-2nd floor	Block 11-1st floor	Block 18-cellarfloor	Block 9 - roof	
Pouring Concrete	P	Block 17-cellarwall	Block 17-cellarwall	Block 27-1st floor	Block 23-cellarfloor		
Gang II	A	Block 17-cellarwall	Block 17-cellarwall	Block 27-1st floor	Block 27-1st floor		Block 23-cellarfloor
Putting prefab. floors into place	P	Block 7-3rd floor	Block 7-3rd floor Block 12-2nd floor	Block 7-3rd floor Block 12-2nd floor		Block 2-roof	Block 2-roof
	A	Block 7-3rd floor	Block 7-3rd floor Block 12-2nd floor	Block 7-3rd floor Block 12-2nd floor	Block 2-roof Block 12 2nd floor Garage 7	Block 2-roof Block 12 2nd floor Garage 7	Block 2-roof
Week 44		**Tuesday 4/6**	**Wednesday 5/6**	**Thursday 6/6**	**Friday 7/6**	**Saturday 8/6**	**Monday 10/6**
Pouring Concrete	P	Block 12-2nd floor	Block 7-3rd floor	Block 7-3rd floor	Block 12-2nd floor	Garage 7	Block 24-foundation
Gang I	A						
Pouring Concrete	P			Block 19-cellarwall	Block 2-roof	Block 2-roof	
Gang II	A						
Putting prefab. floors into place	P	Block 1-5th floor Block 16-1st floor	Block 1-5th floor	Block 1-5th floor	Block 8-3rd floor	Block 8-3rd floor	Block 3-5th floor
	A						

P = planning A = actual performance

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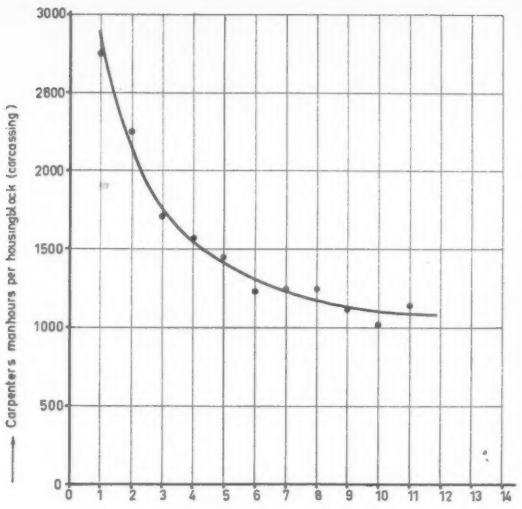


Fig. 5. A graph recording the actual man-hours for carpenters' work as work on the site progressed. Notice the, at first, dramatic improvement in economy as the gangs move from one block to the next. Horizontal figures represent housing blocks.

Short-term plans

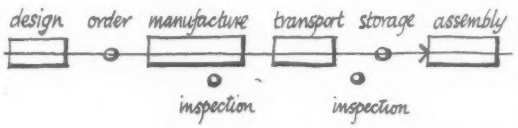
As soon as all kinds of execution data are settled, it is important that the contractor provides for more detailed planning for periods ranging between three and six months. All operations have to be included in this short-term planning.

Weekly programmes

Another even further step is the arrangements of weekly programmes that have to be drawn up weekly by reference to the short-term planning and preferably for two or three weeks in advance. These weekly programmes are very useful for an efficient organization on the site. They also force the persons charged with execution to work systematically, so that much wastage is avoided and good control on the site can be ensured. An example of a weekly programme is given in Fig. 4.

Manufacturing schedules

The scheme outlined above may be described as "vertical" planning for securing co-ordination. Besides this, special attention should be paid to "horizontal" planning. For example, in prefabricated components the sequence is:



This example of "horizontal" planning shows that the interval between design and construction may be very long. With the traditional procedure, it happens all too frequently that the orders can only be placed much too late. One of the causes is that the architect mostly prepares his detail drawings, according to a technical arrangement, but the dates on which the contractor has to place his orders are very different for different parts. This means that he needs the drawings in a different sequence from that of the architect. For that reason a great advantage of including the contractor in the preliminary planning is that consultations can take place in time, and delays can be avoided later on.

Progress control

The management consultant is also charged with the duty of controlling the progress of the operations, in connection with the planning (see Figs. 2 to 4). The state of affairs is reported to the team, if necessary with comment.

Of course, it is the intention of progress control to draw attention to delays. When warned in good time, measures can still be taken. However, the progress control has a preventive effect, too. None of the partners will want to cut a bad figure in the team and everyone tries "to work on time." This has had curious consequences for some partners. A designing office that operated admirably on time in the team, made a sad failure in other—no team—projects.

Thanks also to the planning and progress control, the team projects are proceeding smoothly. A special feature is the short preparatory period. The first project of Team 2 took a preparatory period of only seven months (counted from sketch design to allocation of the work). As a rule the preparatory period comes to double this. The preparations for the second project were ready in sufficient time to meet the termination of the first project.

Mr. Duhoux described already the effect of teamwork on manpower on the building sites. With less manpower production of houses could be increased. Attention paid to the organizability is one reason. But the co-ordination also had effect. Execution went in strict accordance with the planning. Serious interference did not occur. A complete serial production could, therefore, be maintained on the work, from which marked advantages appeared. A third reason is undoubtedly the effect of continuity. The number of hours spent per operation and per housing block showed a permanent drop. An example is given in Fig. 5 for one type of block. If the first housing block took about 2,800 man-hours for carpentry, the last housing block of the series of 11 blocks required only 1,100 man-hours. Though this result is not exclusively attributable to teamwork, it is certain all the same that the teamwork has had a great influence.

The Rotterdam initiative has met with a response elsewhere in our country. Various other municipalities as well as private parties (for the execution of large projects of utility building) have taken the same road. However, the danger of thoughtless application is not imaginary. If one continues, however, to make high demands on working in team system, this development will prove to be of sweeping significance for the rationalization of the building industry.

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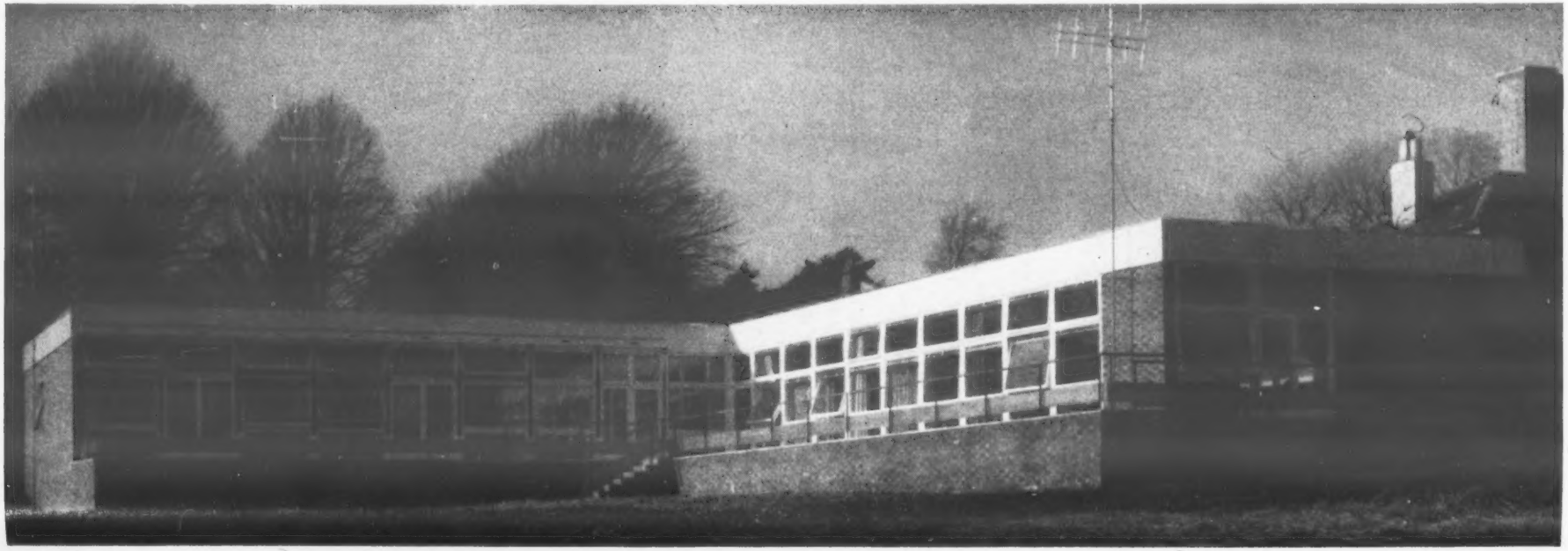
building illustrated

CHILDREN'S WARDS

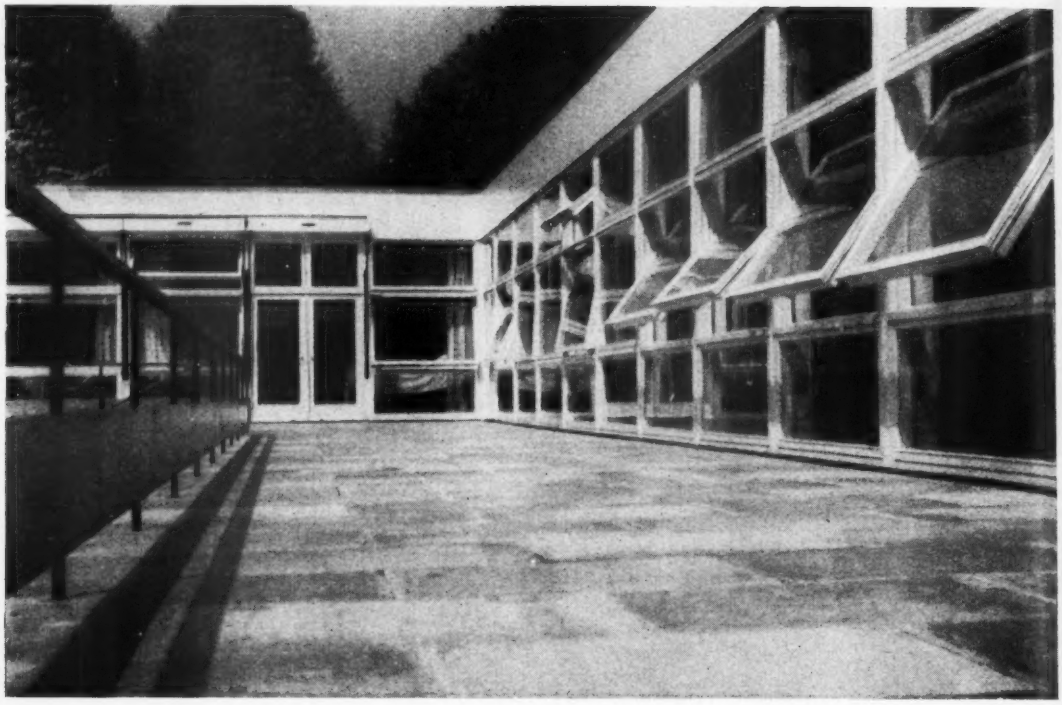
at the MARLBOROUGH CHILDREN'S CONVALESCENT HOSPITAL, KINGSBURY STREET, MARLBOROUGH; designed by STILLMAN and EASTWICK FIELD in co-operation with W. J. JOBSON, regional architect to Oxford Regional Hospital Board; heating and electrical consultants J. ROGER PRESTON and PARTNERS; quantity surveyors DAVIS, BELFIELD and EVEREST

This extension of an existing hospital is of interest as it is one of the most recently built units designed specially for children and embodies a number of new ideas on children's wards developed jointly by the clients and architects. The architects have been generous in sending the JOURNAL their clients' criticisms of the design, a practice which, although it requires courage, can lead to an all-round improvement in knowledge of every building type. We therefore hope that others will feel free enough to follow suit. No cost analysis is given for this building; the use of old foundations and existing boiler and kitchen facilities would render it of little value. General information on the cost is provided.

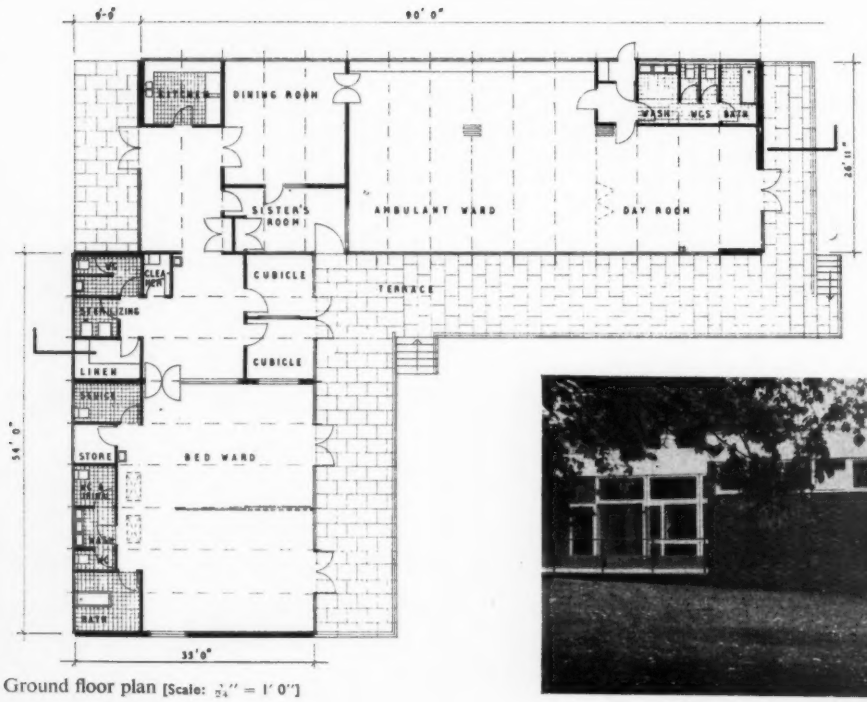
View from the south. The site has a considerable slope and the terraces are retained.



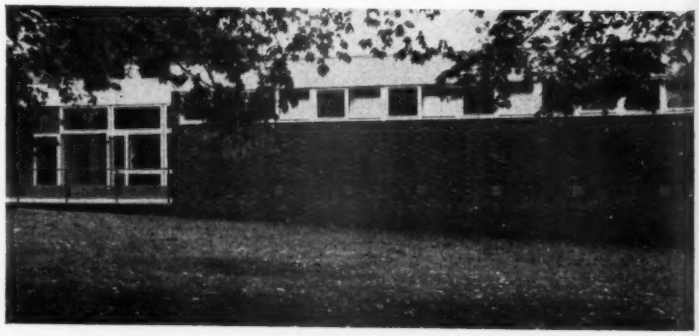
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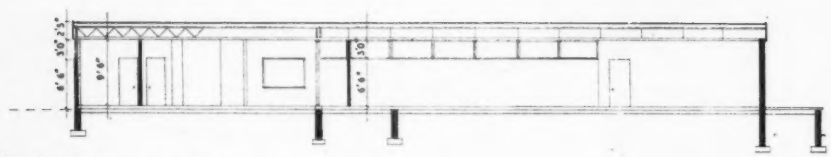
The building replaces a ward which was destroyed by fire in 1954. It provides 26 beds arranged in two wings, one wing containing an ambulant ward and the other a bed ward including two separate cubicles for acute cases. These main spaces, and also the day room and sister's room, are orientated south-east or south-west and look onto wide terraces, one of which is shown above. The windows are double-glazed with venetian blinds within the glazing, including the doors on to the terraces. There are external canvas blinds for protection against strong sunlight.



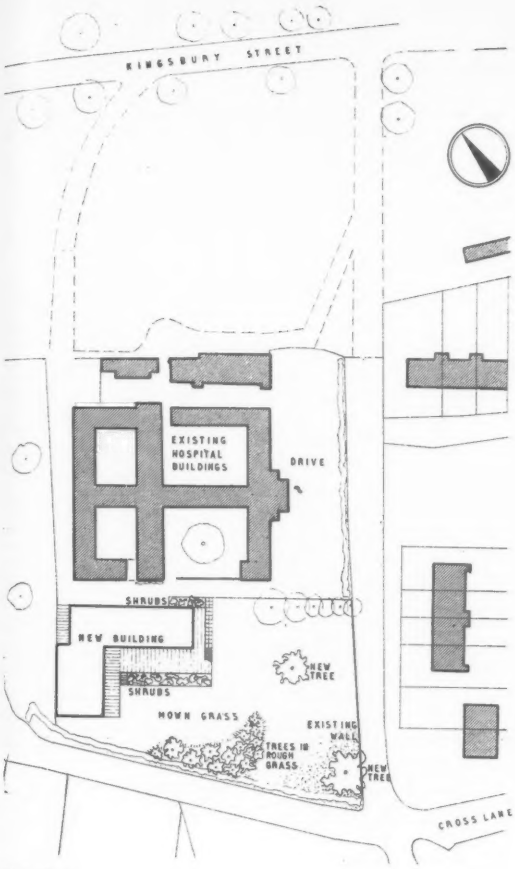
Ground floor plan [Scale: $\frac{1}{24}$" = 1' 0"]



The north-west side of the building, with the main entrance on the left and the high-level strip windows of the service rooms, lavatories, etc., centre and right.



Section [Scale: $\frac{1}{24}$" = 1' 0"]



Site plan

The large entrance foyer serves as an admission room to the unit. The double doors lead to the dining room for ambulant patients. The floor covering in all main spaces in felt-backed p.v.c. sheet and the floor incorporates radiant heating; there is additional heating in ceilings adjacent to the windows. By this means radiators are eliminated and an even temperature gradient is obtained.



analysis

CLIENT'S REQUIREMENTS

The accommodation of 26 long-stay children, all boys, whose ages range between 8 and 15 years, the majority of whom suffer from such conditions as rheumatic fever, rheumatoid arthritis and chronic nephritis. Half the patients spend the whole or greater part of each day in bed, the remainder are up and about. Good facilities were required both for nursing patients and educating them. A cheerful building interior desirable and as convalescent children require constant supervision, easy observation of the patients is essential to avoid employing an unnecessarily large staff. As medical requirements alter with the years the building should be adaptable.

PLANNING AIMS

To accommodate patients in small groups, since it was thought that this fosters friendliness, allowing children with rather similar interests and of approximately the same age to be nursed and taught together, and reducing teasing. Although educationally important for children to be grouped together according to age and ability, it was equally important that these groups be easily amalgamated for communal lessons and for watching films and television, the corollary being that every patient must be able to see without difficulty the teacher and projection screen.

To have a sitting room for " up " patients that would provide an escape from the hospital atmosphere, where each patient might enjoy television or wireless and own a cupboard where personal toys and games could be stored.

Another cupboard in ward to provide good storage space for wellington boots, dressing gown and suit.

A dining room that could be easily supervised from the Sister's office, which could also be used between meals as a quiet place where a boy could read or write letters without interruption from noisy comrades.

CLIENT'S COMMENTS

The design of the block has fulfilled the principal medical requirements admirably. It was thought at first that the folding partition separating the day room from the ward would spoil the appearance of the former and make it a less convivial place, but the drawbacks have proved slight and on those occasions when the staff are much occupied the partition has proved invaluable, since when open it is possible for the Sister to watch the room from her office.

Floor heating has proved pleasant for the patient when he gets out of bed, but is tiring for some of the nurses. Experience with it is limited, but the majority of the staff like it.

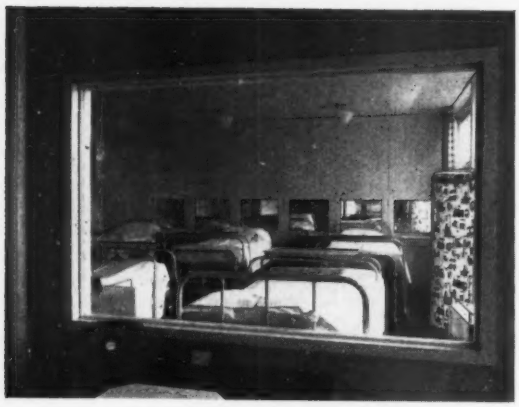
The few drawbacks are of minor importance and several can be easily rectified:

The entrance foyer provides patients and parents with a pleasant admission room, but the large uncurtained windows have unfortunately rendered it an unsuitable place for interviewing parents, being too open to the public gaze, particularly after dark.

The doors on to the balconies from the two cubicles should have been wide enough to permit access of a standard hospital bed.

The large windows in the Unit's kitchen have deprived it of valuable wall space. It would have saved the time of nurses and kitchen staff had there been a bench near the entrance where dirty crockery is easily deposited with a sink beside it and a steriliser immediately beyond. The latter needs to be suitably partitioned for cups, plates, spoons, etc.; a foot pedal should raise the overall container clear of boiling water thus enabling sterilised items to dry

building illustrated



Also opening off the entrance foyer is the Sister's room, which is so placed that the Sister has a view of the dining room and both wards through large plate glass windows; the photograph above shows one of these, looking from the Sister's room into the ambulant ward The latter is normally divided by a sliding-folding partition (to be seen in the photograph) which contains glass viewing panels. The manner in which the wards may be subdivided or thrown open is one of the most interesting features of the building, and results from the client's wish to accommodate the children in small groups but with the possibility of larger groups for teaching, and when watching television, films, etc.



The day room for ambulant patients is at the far end of the ambulant ward and is divided from it by another sliding-folding partition. The ceilings are of plaster absorbant tiles for acoustic correction; the wards are sometimes very noisy places.



The bed ward is divided in two by two large half-glazed panels one of which slides to allow the room to be opened up. In the background of the photograph can be seen the series of windows in the walls of the cubicles adjacent to the ward; these, besides allowing the Sister complete visual control of all the main spaces, also create a pleasant feeling of spaciousness and avoid a sense of isolation for the children confined to the cubicles. The architects were responsible for the decorations and fittings, and this has given a unified character to the interiors.

analysis

quickly, reducing to a minimum the unhygienic use of drying cloths and time spent on washing up. It would have been advantageous to have had cupboards placed near the steriliser, with shelves easily accessible to women of average height, so that cups and plates could have been stacked away without walking unnecessary distances, climbing onto chairs or bending double. A table-high shelf under this cupboard would have been invaluable for stacking bed trays and laying them out before meals.

The urinal alongside the water closet is now considered undesirable. A bench and sink for urine testing is required and it is suggested that the closet be removed and these two items substituted, the urinal remaining.

SUMMARY

Ground floor area: 4,312 sq. ft.
Total floor area: 4,312 sq. ft.
Type of contract: RIBA adapted for Local Authorities.
Tender date: December 1956.
Work began: January 1957.
Work finished: January 1958.
Final contract price of foundations, superstructure, installations and finishes: £25,295.
Final contract price of terraces: £1,550.
Final contract price of other external works: £1,060.
Total: £27,905.
Cost per sq. ft. of floor area (excluding terraces and other external works): $\frac{£25,295}{4,312 \text{ sq. ft.}} = 117\text{s. } 3\frac{3}{4}\text{d.}$

CONTRACTORS

General contractors: R. J. Leighfield & Sons Ltd. *Sub-contractors: Precast tile partitions and terrazzo posts and glazed wall tiling:* Carter & Co., London, Ltd. *" Built-up " felt roofing, etc.:* Neuchatel Asphalt Ltd. *Double glazed wood windows, doors and rooflights:* The Velux Co. Ltd. *Internal flush doors, sliding folding doors and screens:* Walter Lawrence & Son Ltd. *Venetian blinds and external awning blinds:* J. Avery & Co. Ltd. *Curtaining and chairs and tables in entrance:* Conran Fabrics and Conran Furnishings. *Ironmongery including suitable screws:* Alfred G. Roberts Ltd. *Structural steelwork:* R. Smith (Horley) Ltd. *Sliding door gear:* E. Hill Aldam & Co. Ltd. *Fibrous plaster stanchion casings and soffite linings, and " Superacoust " plaster tile suspended ceilings:* Clark & Fenn Ltd. *Sanitary fittings:* Adamsez Ltd. *Medical equipment:* Dent & Hellyer Ltd. *Heating, hot and cold water services:* Benham & Sons Ltd. *Electrical installation and light fittings:* Southern Electricity Board. *Signwriting:* The Lettering Centre. *Fire extinguishers:* Merryweather & Sons Ltd.

HOSTEL

at THURSO, CAITHNESS; designed by R. A. BROCKLESBY, architect to the U. K. ATOMIC ENERGY AUTHORITY, in association with T. C. MYATT, staff architect to W. J. SIMMS, SONS and COOKE LTD.

This three-storey timber hostel was built for unmarried scientists working at the United Kingdom Atomic Energy Authority's fast reactor station at Dounreay, Caithness. Interest in timber construction has been slow to revive after the long period of timber restriction and this hostel must be the first three-storey building to employ this form of construction for many years. It illustrates well the advantages which the material has in permitting a factory prefabrication and speed of erection with a minimum amount of site labour and in allowing a high degree of thermal insulation to be achieved easily and at low extra cost in comparison with other forms of construction. These were all vital factors in designing for such a bleak exposed site in the northernmost tip of Scotland.

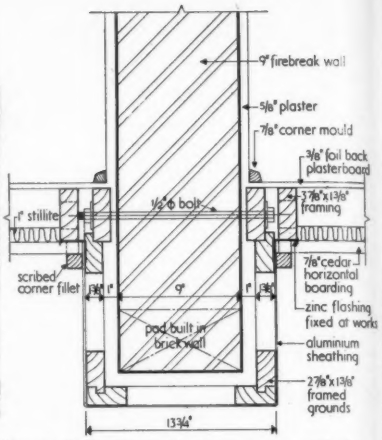
The hostel from the south-east, with the existing Victorian house on the right.



building illustrated

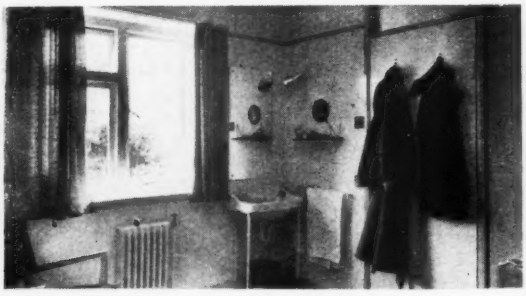




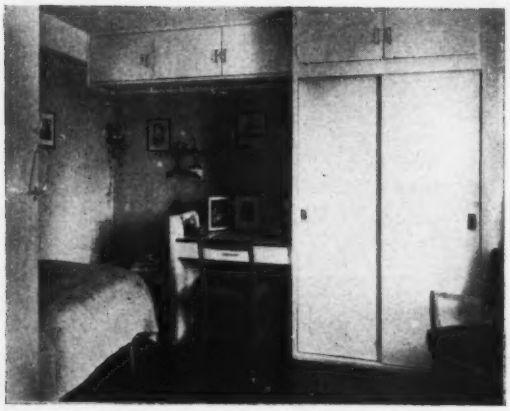


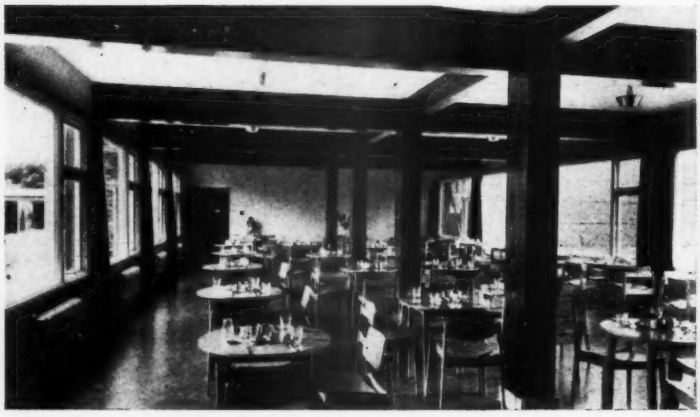


Above left: the windows to the bedrooms are in sympathy with the windows to the existing building, but note the drop in line. Window boxes are painted red, blue or green, the window frames white. The fire check cross walls at third bay centres are clad with aluminium sheeting to reduce heat leaks. Note the self-supporting, free-standing rainwater pipes of one-piece welded steel. Above: the only scaffolding used was a light movable platform frame and a light hoist. The new building forms something of a shot-gun marriage with the old. Left: view of the dining-room wing under construction which links the new building to the existing Victorian house. Beyond can be seen the brick fire-check walls forming the fire separation between the two wings at the point of intersection.



Above: bedrooms are approximately 10 ft. square and are all similarly equipped to this. Below left: walls between bedrooms and onto corridors are sound-insulated. The high level storage unit conceals the projection of the plywood box beam. Below: the double row of columns on the bedroom floors is replaced by a single row through the ground floor dining room. The columns and beams are not as overpowering as in the photograph. They are a light red-brown in colour and contribute a feeling of warmth.







Ground, first and second floor plans, [Scale $\frac{1}{16}$" = 1' 0"]

analysis

CLIENT'S REQUIREMENTS

A three-storey extension to an existing stone-built Victorian house, the whole unit providing a living centre for resident scientists working at Dounreay. The extension contains 72 single bedroom units, a warden's flat, and a dining room. The essential requirement was speed of erection, and a completion time of six months was given.

PLANNING AIMS

The site is in an exposed position in the very north of Scotland with extreme winter conditions. The ground floor has an entrance lobby at the point of interconnection of the two wings with the dining room linking the extension to the existing house. The two upper floors have bedroom units on each side of a central corridor with communal bathrooms and w.c.s.

SUMMARY

Ground floor area: 3,855 sq. ft.
Total floor area: 14,100 sq. ft.
Type of contract: Fixed price without cost variation.
Tender date: May 14, 1956.
Work began: June, 1956.
Work completed: December, 1956.
Final contract price of foundations, superstructure, installations and finishes: £62,382.
Detailed element costs were not available for this building, but those that could be supplied are given below.
External plumbing: £350.
Hot and cold water installation and sanitary fittings: £6,155.
Heating: £3,687.
Electrical installation: £2,066.
Cost per sq. ft.:

$$\frac{\text{£62,382 (excluding external works)}}{\text{14,100 sq. ft. (measured inside external walls)}} = 88\text{s. } 5\tfrac{3}{4}\text{d.}$$

Work below ground floor level
3-ft. × 3-ft. × 2-ft. 6-in. mass concrete column bases.
Strip foundations to fire check cross walls.

STRUCTURAL ELEMENTS

Frame and lead-bearing element
Main structure is of 7-in. × 2½-in. or 3-in. double timber members, 27 ft. 6 in. in height, separated by 4½-in. × 2½-in. blocking pieces and bolted together. The columns are at 10-ft. centres to coincide with the spacing of the bedroom partitions with the intermediate columns positioned along either side of the central corridor. The main beams are of box plywood construction.
9-in. brick fire-check cross walls occur at 3rd bay intervals.

External walls
Western red cedar boarding either vertical or horizontal backed by building paper on 4-in. × 1½-in. stud framing, with the cavities between the framing members filled with insulating quilt.
"U" value: 0·14

$$\text{Ratio: } \frac{\text{solid walls}}{\text{floor area}} = \frac{0{\cdot}76}{1}$$

Windows
Purpose-made double-rebated timber construction with single glazing.

$$\text{Ratio: } \frac{\text{windows}}{\text{floor area}} = \frac{0{\cdot}099}{1}$$

analysis

External doors
Teak in teak frames.
Ratio: $\frac{\text{doors}}{\text{floor area}} = \frac{0{\cdot}006}{1}$

Upper floors
7-in. × 2-in. wood joists spanning between plywood box beams with ⅞-in. t. & g. boarding.
Span: 10 ft. Superload: 50 lb. per sq. ft.

Staircases
Iroko stained and polished finish.
No. of staircases: 1.
Width: 4 ft. 6 in. Total rise: 20 ft., risers: 6½ in.
1 external fire escape, steel.

Roof construction
Timber trusses at 10-ft. centres supporting purlins.

Glazing
Bedroom lights, 24-oz. glass.
Dining room, ¼-in. p.p.

PARTITIONING AND FITTINGS

Internal partitions
3-in. × 1½-in. timber studs with quilt between studs to reduce sound transmission between bedrooms. Faced ⅜-in. foil-faced plasterboard with taped joints.

Internal doors
Ply-faced flush doors with wood frames.
No. of single doors: 121.
No. of double doors: 1 pair.

Ironmongery
Copper plated on brass.

Fittings
Each bedroom is provided with a wardrobe with sliding doors, dressing table unit and high level storage cupboards, mirrors, shelves.

FINISHINGS

Floor finishes
Generally, 3·2 mm. linoleum on timber boarding.
Staircase, lacquered hardwood.

Wall finishes
⅜-in. foil-faced plasterboard with taped joints.

Ceiling finishes
Ground floor and first floor, ⅜-in. foil-faced plasterboard with taped joints.
2nd floor, 2-in. vermiculite slabs and ½-in. plaster.

Roof finishes
Proprietary corrugated " clip-on " aluminium roofing with aluminium flashings and weatherings.
Area: 7,000 sq. ft.

Decorations
Wallpaper to all bedrooms, staff dining room, television room, quiet lounge, writing room and table tennis room. Distemper to service rooms. Gloss paint in lavatories and cloakrooms.
Woodwork, 2 coats oil paint, gloss finish, 3 coats externally.

SERVICES

External plumbing
Secret rainwater gutters welded in one piece and down pipes welded in one piece.

Hot and cold water installation
Low pressure with two 300-gallon calorifiers on ground floor.

Sanitary fittings

Type of fitting	*No. of each type*
Lavatory basins	74
Baths	6
Showers	4
W.c.s	9
Sinks	4

Heating
Low pressure hot water designed to maintain an internal temperature of 60 deg. F. in the bedrooms and 55 deg. F. in stairwells and corridors at an external temperature of 25 deg. F. Heat loss coefficients have been based on a severe exposure classification.
" U " of external walls, 0·14.
" U " of roof, 0·14.

Electrical installation
Schedule of points in bedrooms:
1 ceiling lighting point.
1 wall lighting point at head of bed.
1 mirror lighting point.
1 13-amp. switched socket outlet.

Drainage
Combined surface water and soil drainage. Stoneware soil water drains.

CONTRACTORS

General contractors: W. J. Simms, Son & Cooke Ltd. *Electrical wiring and installation:* Hartley Electromotives Ltd. *Plumbing and site works:* Alexander Sutherland. *Impregnation of timber:* Hicksons Timber Impregnation (G.B.) Ltd. *Painting:* A. T. Rolland Ltd. *Central heating:* John Hughes & Co. (Heating) Ltd.

DESIGNED BRICKWORK

This Sheet describes the method of designing brickwork according to British Standard Code of Practice C.P.111: 1948, *Structural Recommendations for Loadbearing Walls.*

General

The Ministry of Health Model Byelaws Series IV "Buildings" require that a loadbearing wall *shall be capable of safely sustaining and transmitting the dead load and imposed loads and the horizontal and inclined forces to which it may be subjected without exceeding the appropriate limits of stress for the materials of which it is constructed and without undue deflection.*

This provision may be satisfied in the following two ways:

(*a*) by determining the thickness of the wall in relation to its height and length, in accordance with the rule of thumb method set out in the Third Schedule of the Model Byelaws;

(*b*) by calculating the thickness of the wall required to carry the loads on it, in conjunction with certain specified permissible stresses, as set out in C.P.111.

It is found that the second method, by taking account of the strength of bricks and mortar, the quality of workmanship and the imposed loads (especially as applied to multi-storeyed buildings), shows considerable economies in labour and materials over the first method.

Definitions

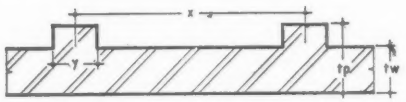
Effective height: Where wall is laterally supported* top and bottom, effective height = $\frac{3}{4}$ × height between supports.

Where wall is laterally supported* only at bottom, effective height = $\frac{3}{2}$ × height of wall above this support.

* This term is defined in detail in C.P.111: 1948.

Effective length: This is the distance between centre lines of properly bonded adjacent piers, buttresses or intersecting walls.

Effective thickness of solid wall = actual thickness × factor in the table below.



$\frac{x}{y}$	Factor $\left(\frac{\text{effective thickness}}{\text{actual thickness}}\right)$		
	$\frac{tp}{tw} = 1$	$\frac{tp}{tw} = 2$	$\frac{tp}{tw} = 3$ (including intersecting walls)
6	1·0	1·4	2·0
8	1·0	1·3	1·7
10	1·0	1·2	1·4
15	1·0	1·1	1·2
20 or more	1·0	1·0	1·0

Note: This modification may not be used if the effective length of the wall is less than its effective height.

Effective thickness of cavity wall = $\frac{2}{3}$ × sum of thicknesses of two leaves, even if only one leaf carries the load.

$$\textit{Slenderness ratio} \text{ of wall} = \frac{\text{effective height or effective length (whichever is less)}}{\text{effective thickness.}}$$

The slenderness ratio should not exceed 18 (or 24 for dwelling houses of not more than 2 storeys), but *must not* exceed 12 where lime mortar is used.

Calculation of maximum permissible stress

The permissible stress uniformly distributed in wall depends on:

(*a*) crushing strength of brick units;

(*b*) grade of mortar;

(*c*) slenderness ratio.

From the brick units and grade of mortar to be used, and assuming a slenderness ratio of unity, a stress value is found from Table 1: this value is then multiplied by the factor corresponding to the actual slenderness ratio found from Table 2, which gives the maximum permissible stress.

Table 1: Where the slenderness ratio is not more than unity, the stress in the wall due to the combined dead and imposed loading, uniformly distributed over the area sustaining the load, should not exceed the values given in the table below, at or after the times stated. The stresses are given in lb./sq. in.

Crushing strength of brick in lb./sq. in. (linear interpolation allowed)	Mortar (by volume) not weaker than:					
	Cement*	Cement-lime			Hydraulic lime	Non-hydraulic lime
	1:0-¼:3 (7 days)	1:1:6 (14 days)	1:2:9 (14 days)	1:3:12 (14 days)	1:2 (14 days)	1:3 (28 days min.)
400	40	40	40	30	30	30
1,000	100	100	80	70	70	60
1,500	150	140	120	100	100	80
3,000	210	190	170	130	130	100
4,000	250	230	210	170	170	100
5,000	360	260	250	200	200	100
7,500	510	350	350	200	200	100
10,000	660†	350	350	200	200	100

* In cement mortar, the inclusion of lime is optional.

† If strength of brick is 10,000 + λ, stress may be increased to 660 + 0·042 λ but not more than 900.

Table 2: Where the slenderness ratio exceeds unity, the values from Table 1 should be multiplied by the factor tabulated below. Linear interpolation is allowed.

Slenderness ratio	Factor	Slenderness ratio	Factor
1	1·00	12	0·50
2	0·96	14	0·40
4	0·88	16	0·35
6	0·80	18	0·30
8	0·70	21	0·25
10	0·60	24	0·20

2.B6 DESIGNED BRICKWORK

Loading

The Second Schedule of the Model Byelaws provides a table of the minimum permitted imposed loads on floors, which may be reduced (where the building is not a warehouse, a garage or intended chiefly for storage).

Table 3

Number of floors above floor under consideration	Percentage reduction in imposed floor loads
Roof only	0
1 floor and roof	0
2 floors and roof	10
3 floors and roof	20
4 floors and roof	30
5 or more floors and roof	40

Eccentric loads and lateral forces: The maximum stresses due to these forces may exceed permitted stresses from Table 1 by not more than 25%. Wind pressures can be ignored for most buildings of solid wall construction where the height does not exceed twice the base-width.

Concentrated loads: These should be calculated as uniformly distributed pressures under the contact area, and the maximum permitted stresses from Table 1 may be exceeded by not more than 50%. Where wall-plates, etc., have to be built in, the reduced thickness of the wall must be adequate to carry all the calculated load.

General performance of walls

The thickness of an external wall, even though calculated to be structurally sufficient, may have to be increased to provide adequate standards of insulation and resistance to rain penetration.

Method

1. Loads per foot run of wall to be tabulated.
2. Effective height of each storey to be found. Effective thickness of each storey to be found.
Hence, slenderness ratio $\left(\frac{\text{effective height}}{\text{effective thickness}}\right)$
3. From grade of mortar and crushing strength of bricks, the maximum permitted stress on wall to be found for unit slenderness ratio from Table 1. Reduced permitted stress for actual slenderness ratio to be found, using Table 2.
4. Loads for successive floors, from roof downwards, to be tabulated, including reductions from Table 3.
Actual stress $\left(\frac{\text{total load}}{\text{area}}\right)$ to be checked at each storey height against maximum permitted stress already computed.

Note: Thickening of the wall increases the permitted stress by reducing the slenderness ratio as well as reducing the actual stress, but the permitted stress may alternatively be increased by using a stronger mortar (or a stronger brick).

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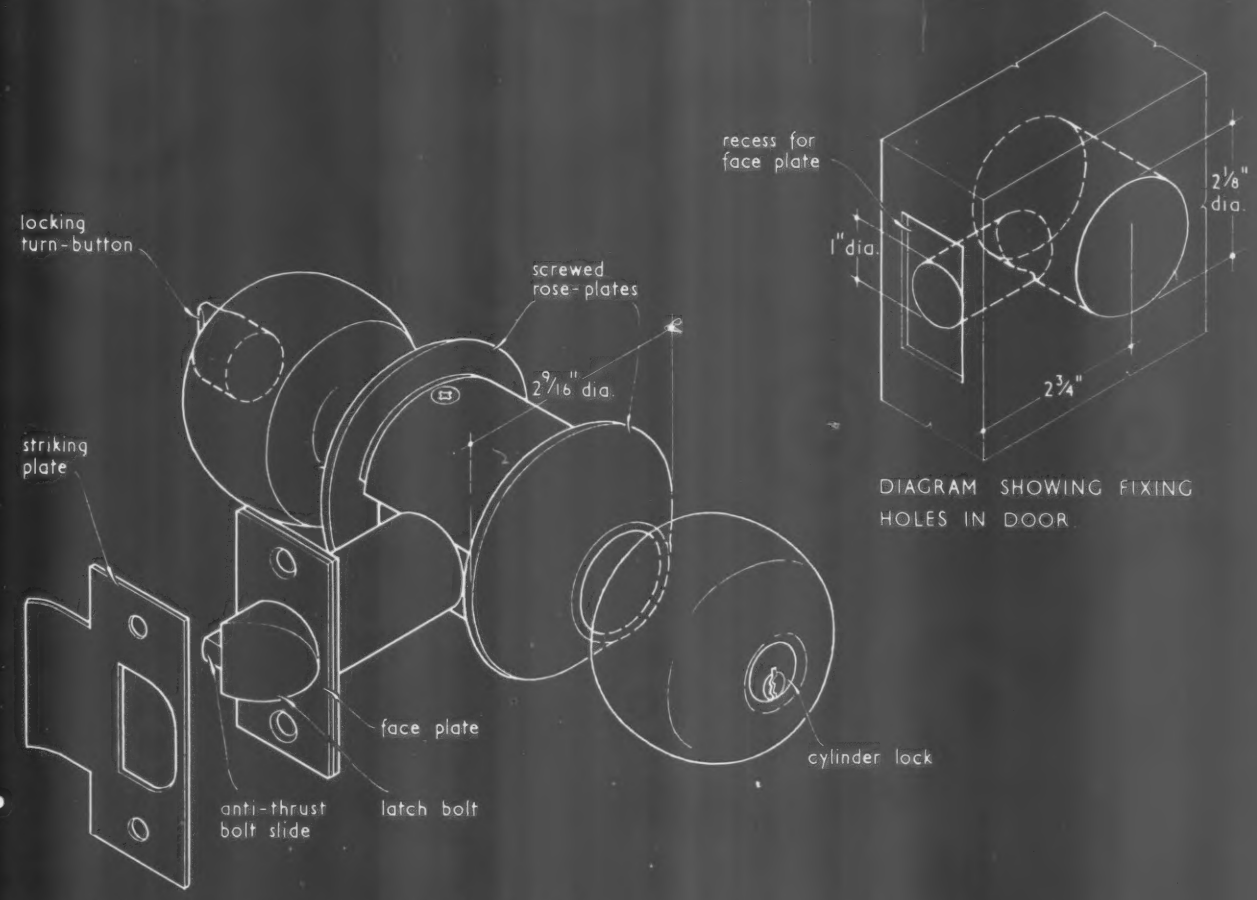
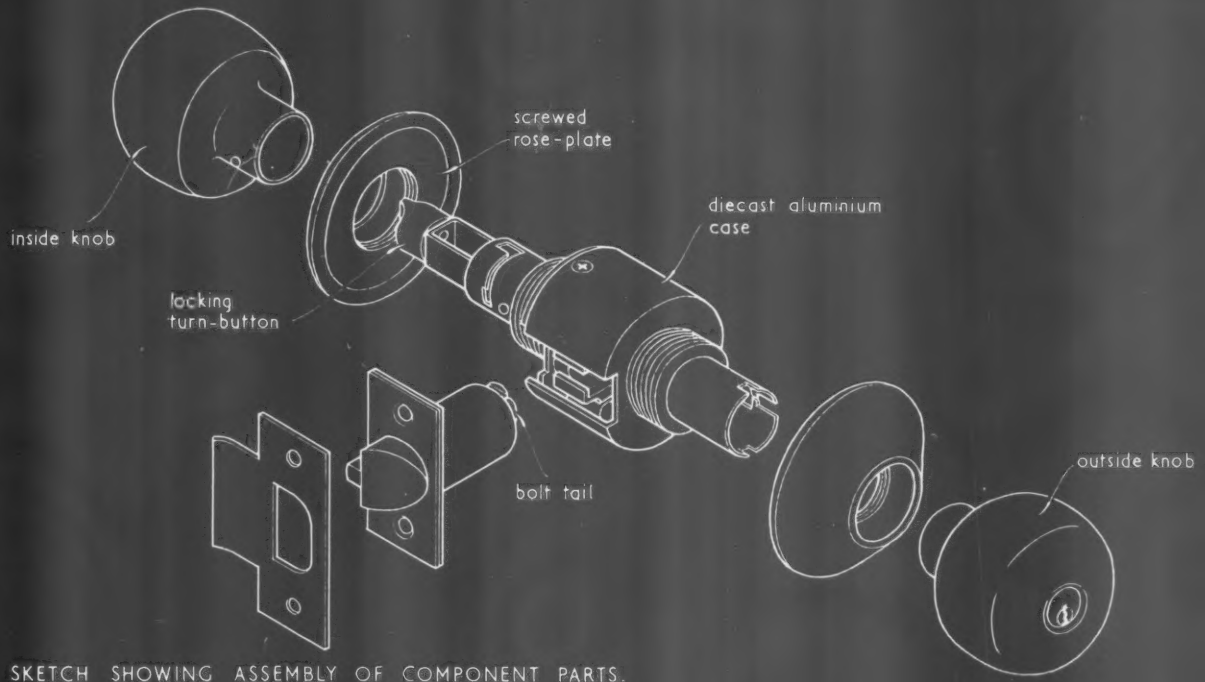


DIAGRAM SHOWING FIXING HOLES IN DOOR

ISOMETRIC VIEW OF TYPICAL LOCK (NO. 9100).



SKETCH SHOWING ASSEMBLY OF COMPONENT PARTS.

·UNION· DOOR FURNITURE. Manufacturer : Josiah Parkes and Sons Ltd.

44.J4 ·UNION· DOOR FURNITURE

This Sheet describes Union knob-sets and accessories. The isometric sketches on the face show a typical knob-set and the assembly of component parts.

Construction

The cylindrical case of diecast aluminium is 2 in. in diameter and contains the mechanism for converting the turn of the knob to a pull on the bolt tail. It also contains the spindle which prevents the knob from turning when the door is locked. The reversible latch has a steel case $\frac{31}{32}$ in. in diameter and brass bolt with $\frac{1}{2}$-in. plain shoot or anti-thrust mechanism, depending on the function of the knob-set. Face plates may be brass, nickel bronze, bronze or aluminium and are $2\frac{1}{4}$ in. by $1\frac{1}{8}$ in., flat as standard, but obtainable bevelled ($\frac{1}{8}$ in. in 2 in.) to order. Striking plates are $2\frac{3}{4}$ in. by $1\frac{1}{8}$ in. in the same materials as face plates, with fixing holes at $2\frac{1}{8}$ in. centres. Components for rebated doors are available.

Knobs are $2\frac{1}{8}$ in. and roses $2\frac{9}{16}$ in. in diameter and they are available in pressed brass, nickel bronze, bronze or aluminium. Roses are screwed on, which gives some latitude of adjustment for door thicknesses. The normal backset is $2\frac{3}{4}$ in. from the edge of the door to the centre of the knob, but a special 5-in. backset adaptor is available for use where required. A 5-in. diameter rose is also available for decorative purposes, or to act as a finger-plate, and with this the 5-in. backset adaptor must be used.

Locks: Cylinder locks, where fitted, are of brass with 5-pin tumbler, nickel silver pins and phosphor-bronze springs. Two nickel silver keys are supplied. The locks may be master-keyed *en suite* with mortice and rimlocks, padlocks and cabinet cylinder locks of the appropriate key blank size.

Types

The following types of knob-set are available:

Key and turn-button set (*Model No.* 9100)*:* The latch bolt is withdrawn by either knob, except when the outside knob is locked by the turn-button in the inside knob. When locked, the latch bolt is withdrawn by turning the inside knob or by key in the outside knob. The outside knob remains locked until the turn-button is released. An anti-thrust latch is supplied.

Push-button set (*Model No.* 9101)*:* This is for use where privacy, not security, is required. The latch bolt is withdrawn by either knob except when the outside knob is locked by the push-button in the inside knob. The outside knob remains locked until the push-button is released, either by turning the inside knob or by operating the emergency release through a small hole in the outside knob. A plain latch is supplied.

Plain latch set (*Model No.* 9102)*:* The latch bolt may always be withdrawn by knob from either side. A plain latch is supplied.

Night latch set (*Model No.* 9103)*:* The latch bolt is withdrawn by key from outside and knob from inside: the outside knob is always locked and the inside knob always free. An anti-thrust latch is supplied.

Communicating door set (*Model No.* 9104)*:* The latch bolt is withdrawn by either knob except when locked by either turn-button: each turn-button locks both knobs and both must be released to unlock the knobs. An anti-thrust latch is supplied.

Double cylinder set (*Model No.* 9105)*:* The latch bolt is withdrawn by either knob, except when the knobs are locked by key in either cylinder. Each cylinder locks or unlocks both knobs. An anti-thrust latch is supplied.

Single cylinder set (*Model No.* 9106)*:* The latch bolt may be withdrawn by either knob. The inside knob is always free and the outside knob may be locked or unlocked only by key in the outside cylinder. An anti-thrust latch is supplied.

Fixing

The knob-sets are suitable for doors hinged on either the right or left hand and opening inwards or outwards. The standard pattern is suitable for doors from $1\frac{3}{8}$ in. to $1\frac{7}{8}$ in. finished thickness, but with the use of special roses doors up to $2\frac{1}{4}$ in. can be accommodated. Two holes are drilled in the door as shown in the diagram on the upper right face of the Sheet, and a recess made for the face plate. The latch is first fixed in position in the hole provided. The cylindrical mechanism case with the inside knob and rose removed, slides through the second hole to engage with the rear end of the latch. The cylindrical unit should be central to the door thickness, and this is achieved by adjusting the position of the outside rose and locking with the screw provided. The cylindrical case is clamped in position by screwing on the inside rose and the inside knob is then replaced. A recess for the striking plate is provided on the door jamb and a hole cut for the latch bolt.

Finish

All brass or bronze knobs and roses are polished, satin-finished or chromium-plated. Aluminium knobs and roses are silver-anodised. Steel components are heavily zinc-plated and aluminium die-castings anodised.

Compiled from information supplied by:
Josiah Parkes and Sons Ltd.
Address: Union Works, Willenhall, Staffs.
Telephone: Willenhall 345.
London Office: Bush House Aldwych, London, W.C.2.
Telephone: Temple Bar 6170

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ILLUMINATED CEILING: BOARD ROOM, OFFICES IN LONDON, S.W.1

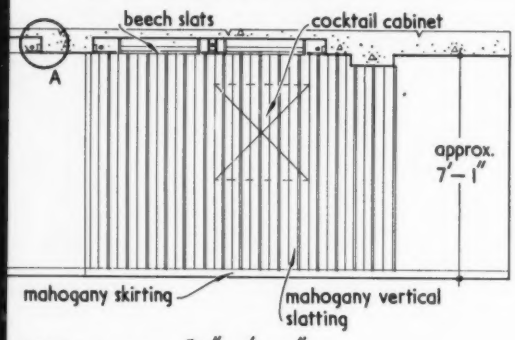
C. J. Epril and Associates, architects



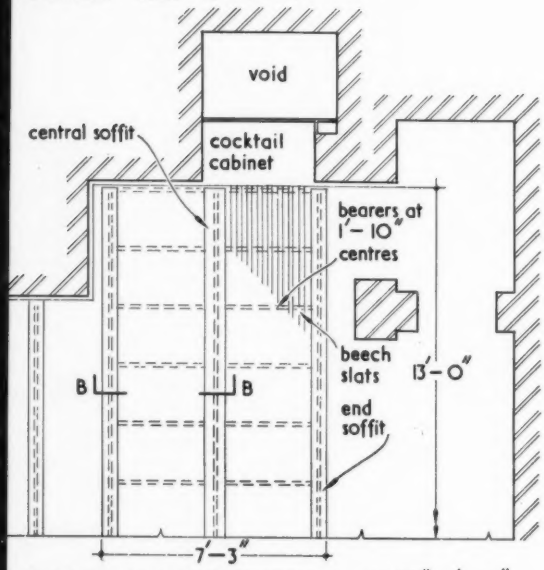
The pattern induced by the beech slats and bearers of this timber suspended ceiling is sufficiently strong to give the impression of an even overall lighting, though in fact the light is produced by three banks of fluorescent tubes, which lie at the outside edges of the ceiling and behind the central soffit which divides the two bays. Another point to notice is the relative shallowness of the ceiling—only about 6 in. To sum up, this is an excellent example of how to produce a very sophisticated effect, using only the simplest fittings.

ILLUMINATED CEILING: BOARD ROOM, OFFICES IN LONDON, S.W.1

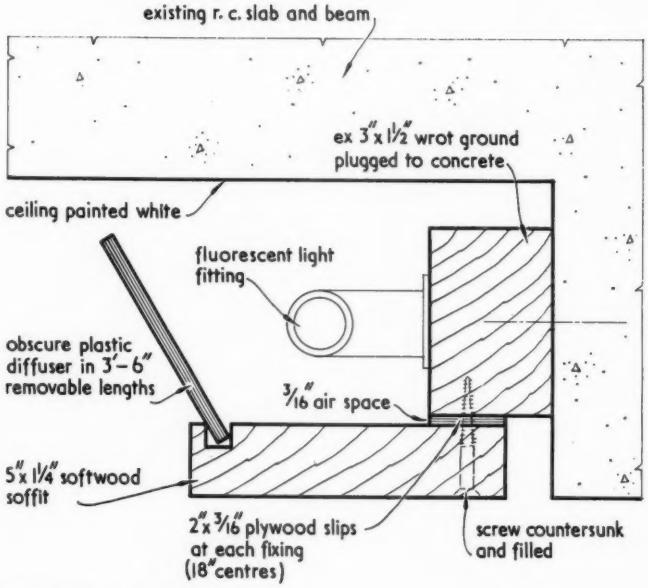
C. J. Epril and Associates, architects



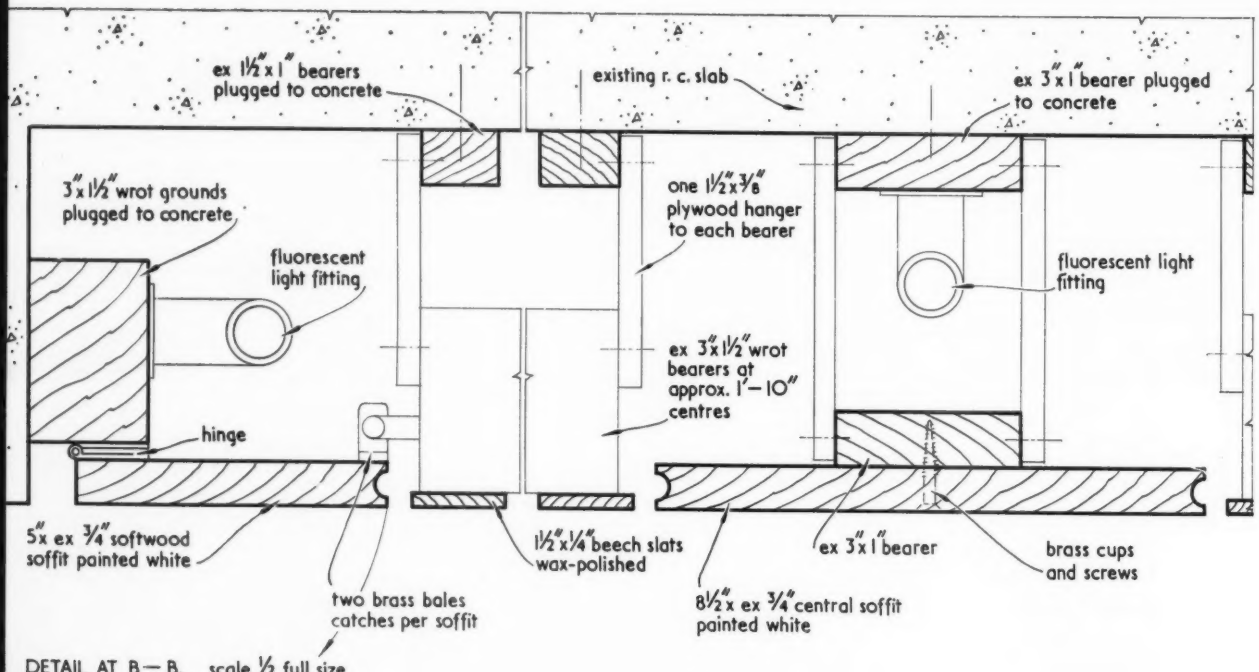
SECTION. scale 3/16" = 1'–0"



PLAN OF CEILING FROM ABOVE scale 3/16" = 1'–0"



DETAIL AT A. scale ½ full size



DETAIL AT B—B. scale ½ full size

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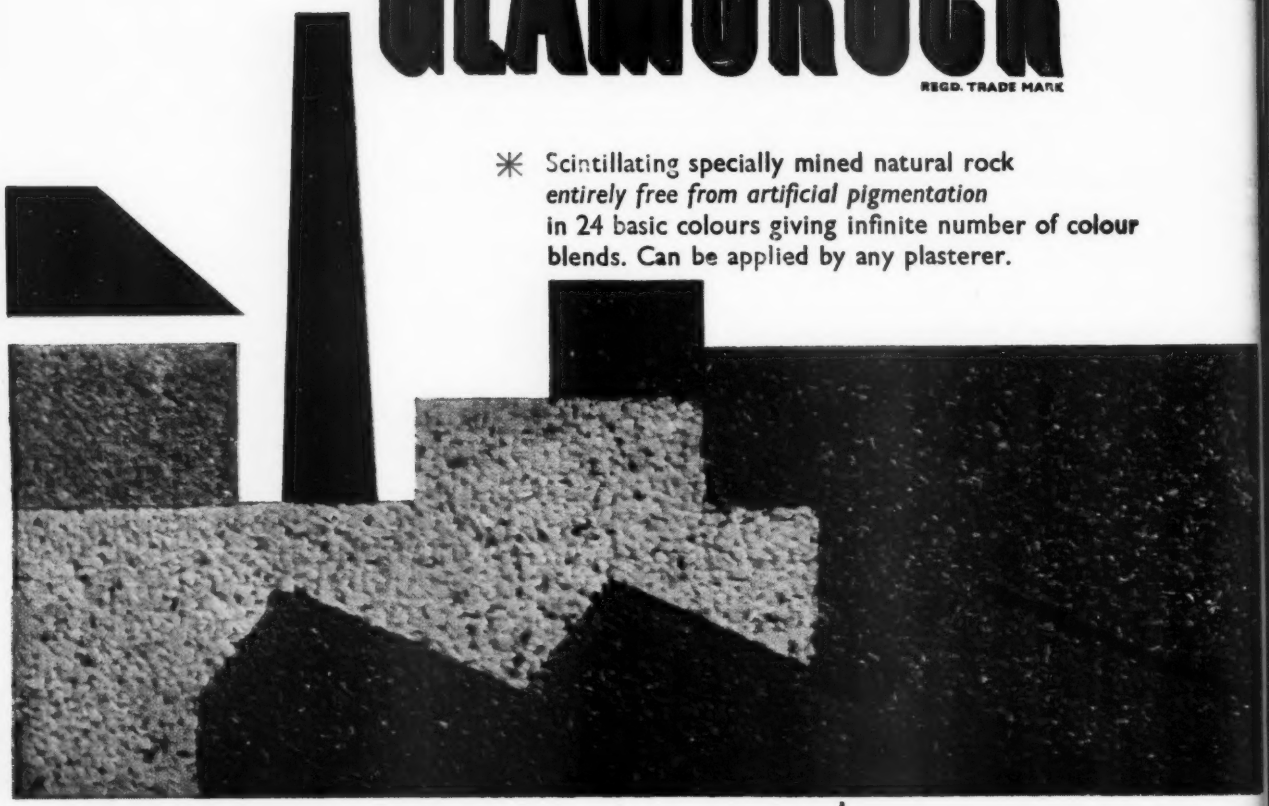
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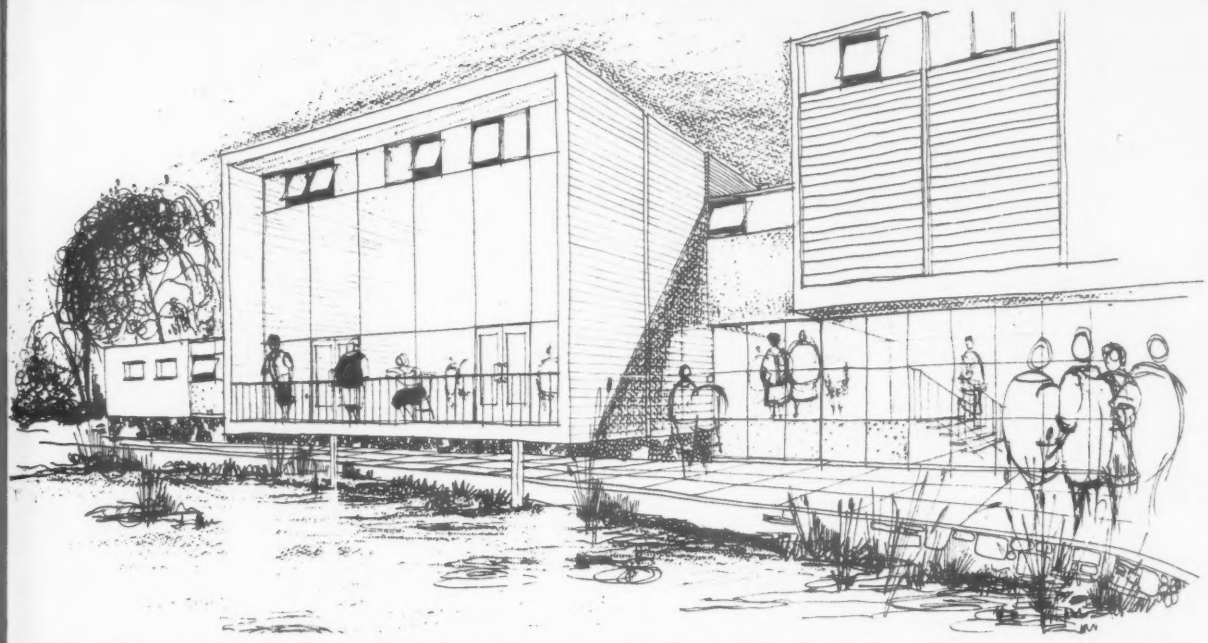
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An assembly hall which projects over a small lake is an unusual amenity for girls at Canterbury County Technical School extension, designed by the City architect, John L. Berbiers, the plans for which have recently been approved. Building will begin in the spring. The extension is designed as a self-contained unit, linked with the existing school by a covered way, and providing an assembly hall-cum-dining room, gymnasium, practical rooms, classrooms, and cloakrooms. A compact two-storey plan, with gymnasium and classrooms on the first floor and hall, foyer and kitchen on an intermediate level make the most of a restricted site.

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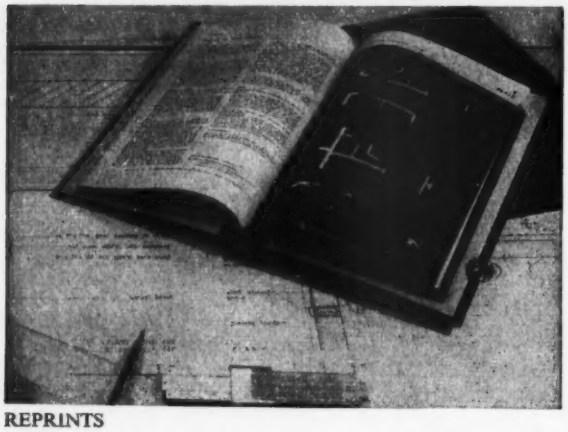
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Announcements

TRADE

Basil Yeoman has recently joined the Board of Lanner Ltd. and its associate companies.

Quickset Water Sealers Ltd., have opened a new branch office at Haddricks Mill Road, South Gosforth, Newcastle upon Tyne 3.

Leaderflush (Doors) Ltd., have appointed Messrs. William Roberts & Co. Ltd., Menai Bridge, Anglesey, to act as sole distributors of Leaderflush doors for Anglesey and Caernarvonshire.

E. D. Hinchliffe has relinquished his appointments as Deputy Chairman and Joint Managing Director of Hills (West Bromwich) Ltd. He continues as an active director of the company. H. Gaydon, hitherto Joint Managing Director, has been appointed Deputy Chairman and sole Managing Director.

The Concrete Products Division of Cawood Wharton & Co. Ltd., Cavendish House, Woolwich Road, S.E.7, has been transferred from their West Drayton factory to their works at Blackwall Lane, London, S.E.10. T. Wynne has been appointed sales representative to the Concrete Products Division of Cawood Wharton & Co. Ltd.

Correction

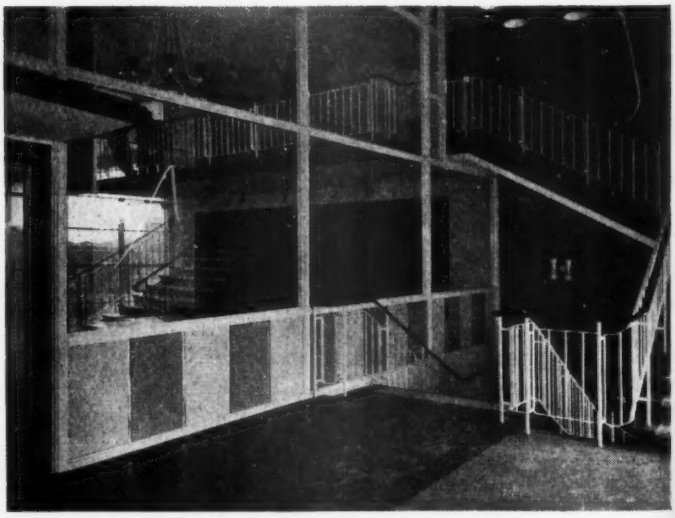
In our feature on Gatwick Airport (AJ, August 14) the sub-contractors for the cladding to the boiler house and freight-handling building were the Universal Asbestos Manufacturing Co. Ltd., who also supplied much of the pitch fibre cable conduit.

Panelling pianissimo . . .

Colour does not have to be played *double forte* all the time. With SEAPORCLAD and SEAPORCEL vitreous porcelain enamel any effect from ***pp*** to ***ff*** can be achieved in exterior or interior schemes.

In the Wales Empire Pool, for instance, quiet subdued tones were envisaged for the Restaurant partition walls.

SEAPORCLAD was chosen and light and mid-grey shades stipulated. These were faithfully (and permanently) reproduced in the matt-finished vitreous porcelain enamelled panels; double-sided and laminated with a 2 in. paper honeycomb core.



Wales Empire Pool, Cardiff. City Architect's Dept.

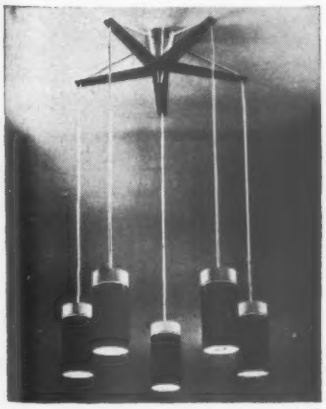
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Ormlie Lodge — 'Pyrolith' R.T.M. flameproofed over a cup of tea!





Box beams about to be impregnated with 'Pyrolith'.

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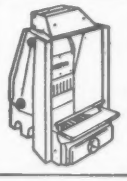
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The height of SPUR brackets can be altered without the use of tools whenever storage needs change. Alignment is automatic. Both right-angled and slanting brackets are available.

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No upright supports at front or side are needed with SPUR. This means a more pleasing design as well as easier access to shelves.

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Uprights are available in lengths up to 94½ in., and brackets are supplied in seven standard sizes up to a maximum of 18½ in. Loadings have been calculated for each size, and the largest will support 1½ cwt.



WALL FIXING OR FREE STANDING

The uprights are easily screwed to walls, but where free standing units are required with shelves both sides—in libraries or storerooms for example—double-sided uprights can be used. Special collars are available for fixing uprights to the floor and ceiling.

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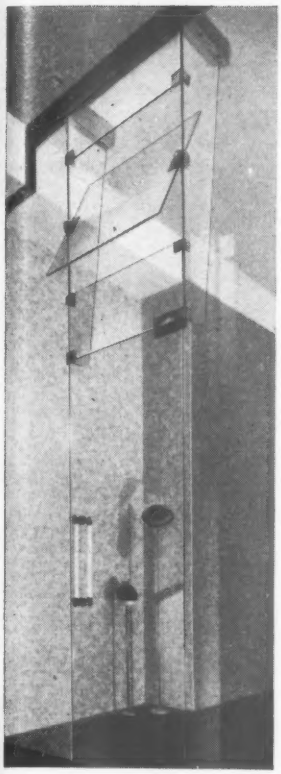
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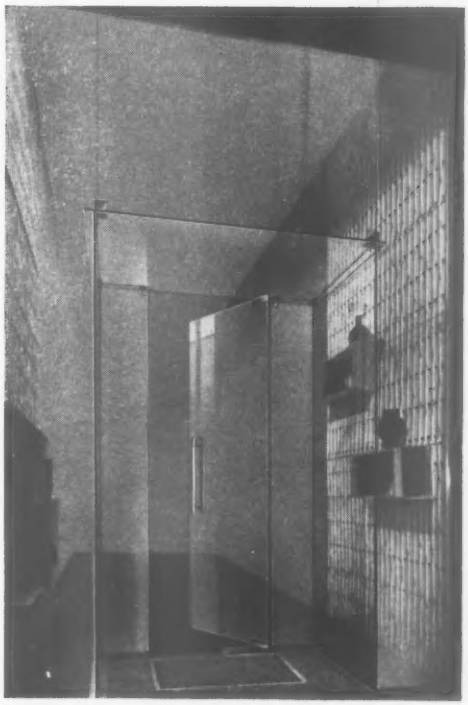
TGA 51.1



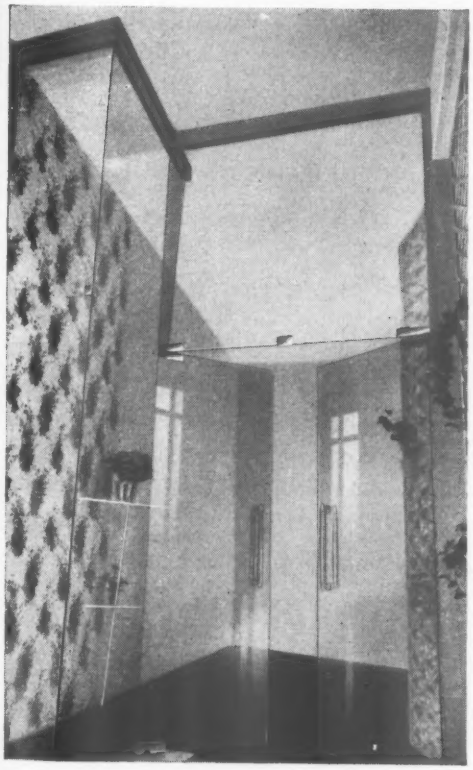
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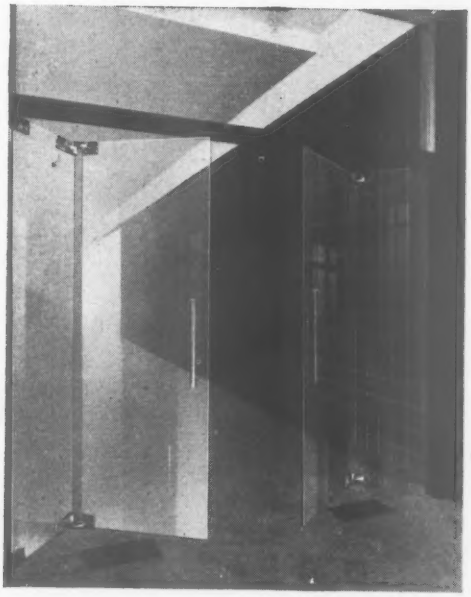


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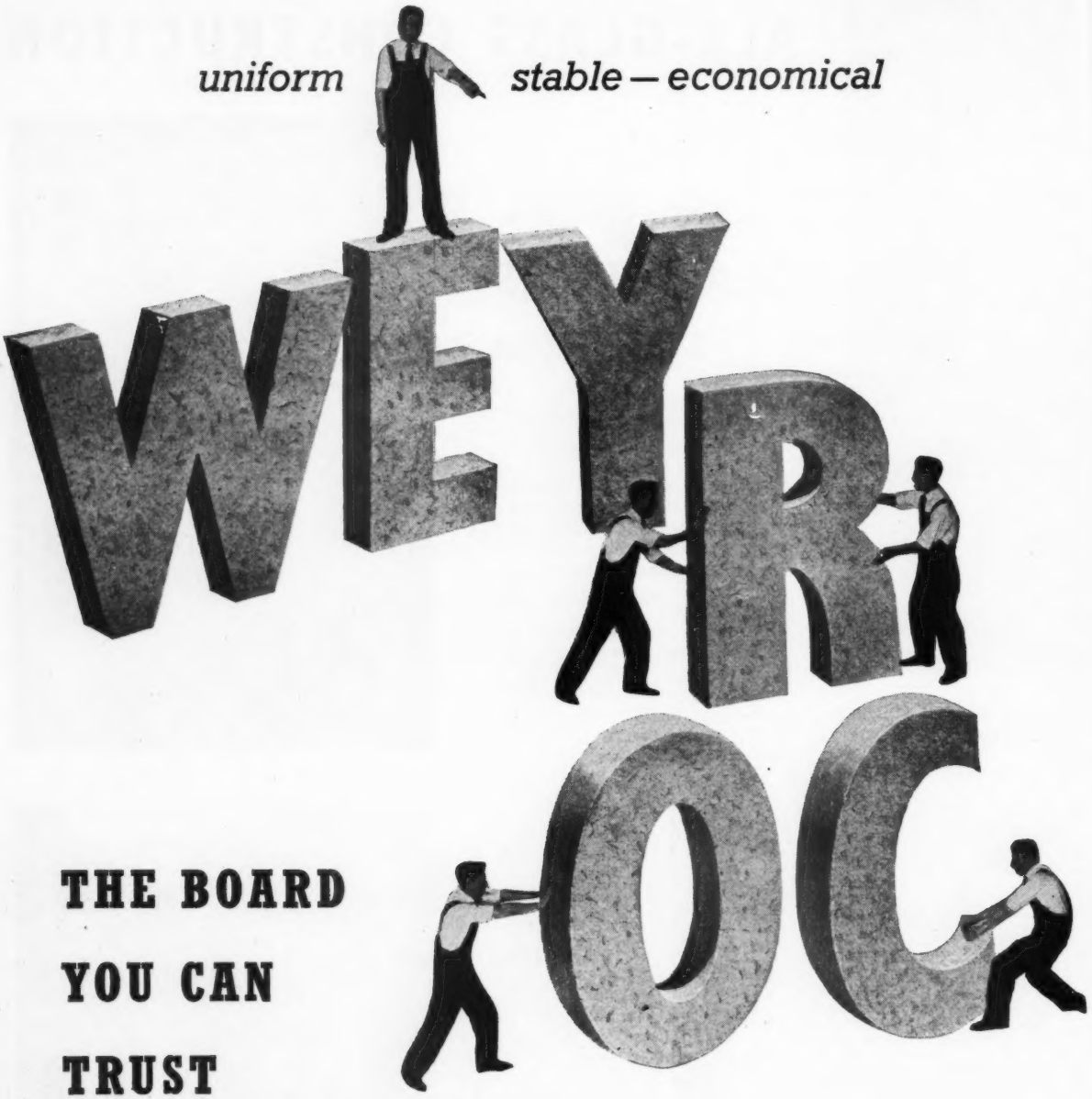


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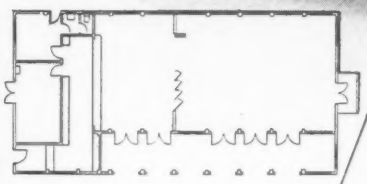
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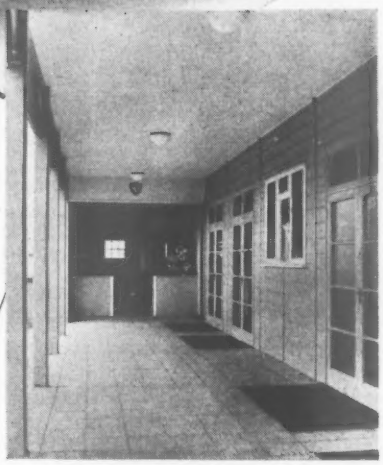


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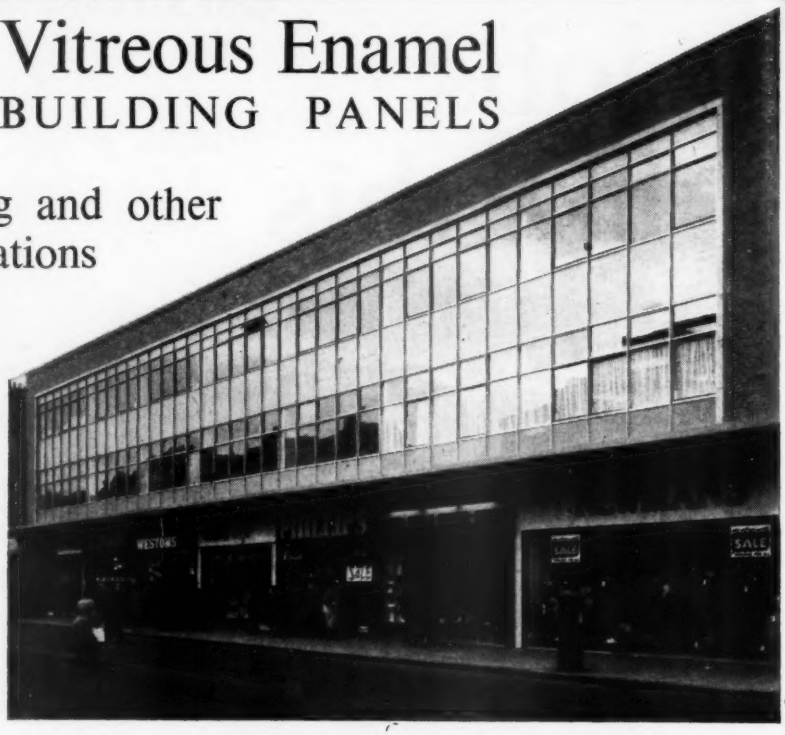
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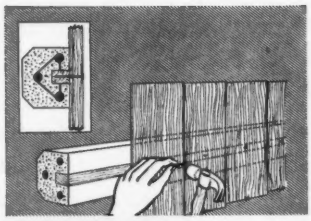


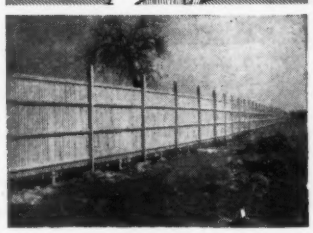
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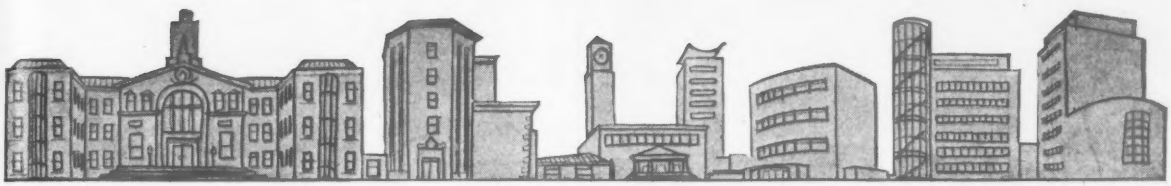


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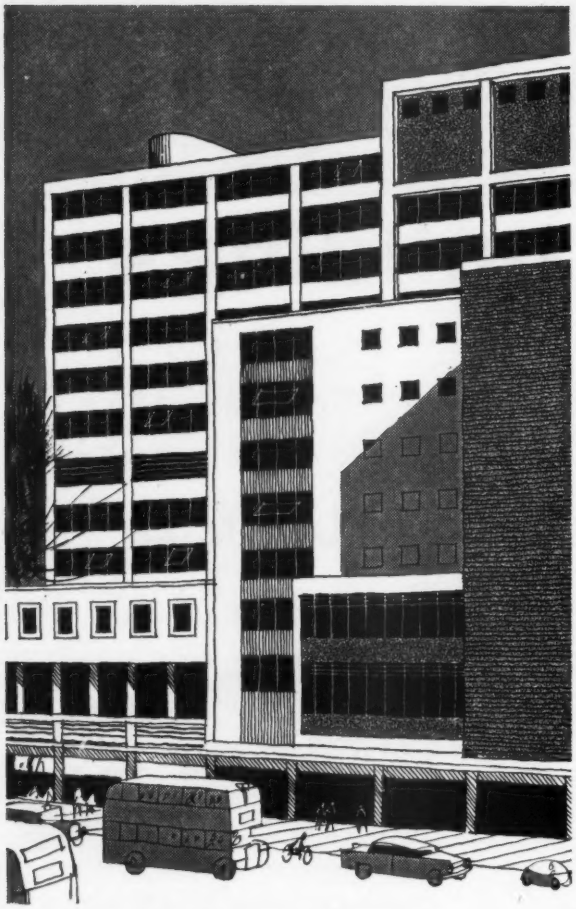
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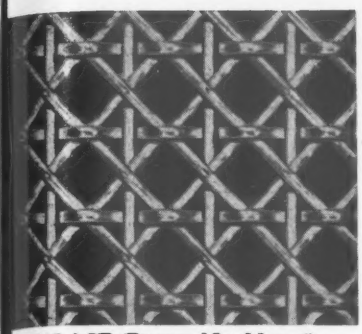


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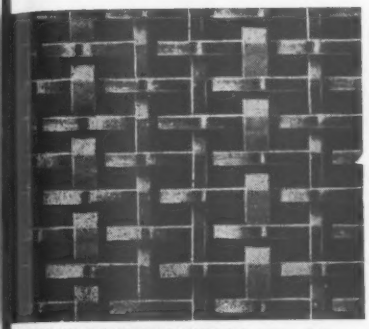
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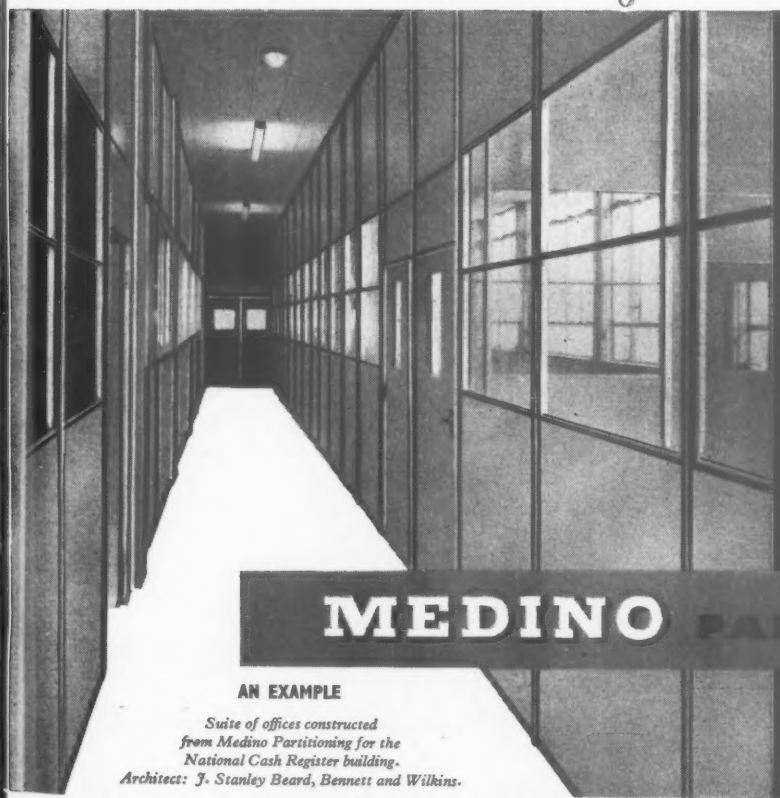


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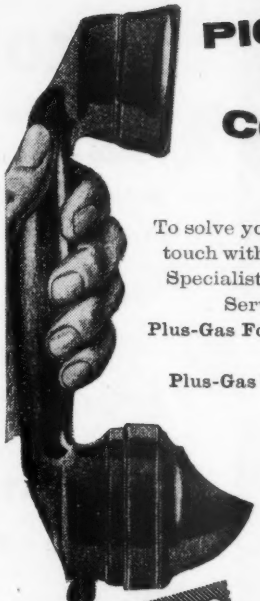
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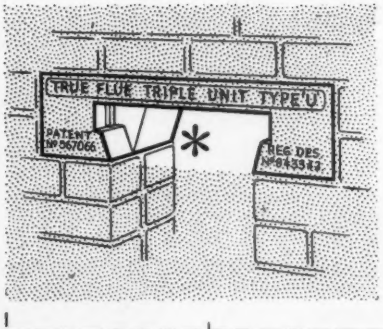


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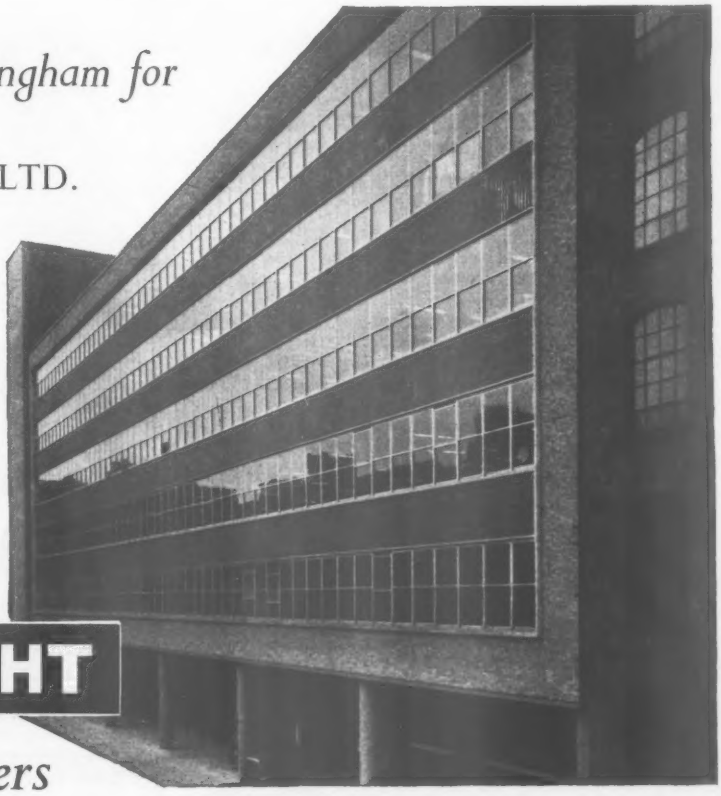
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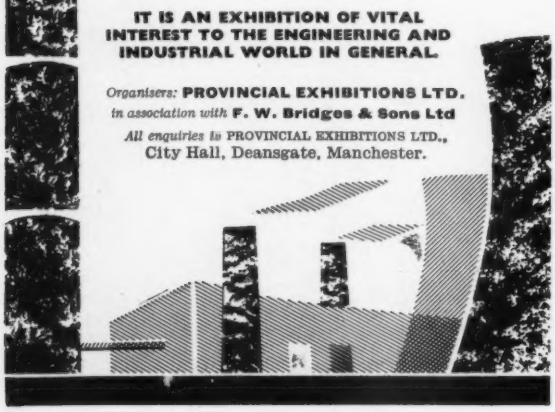
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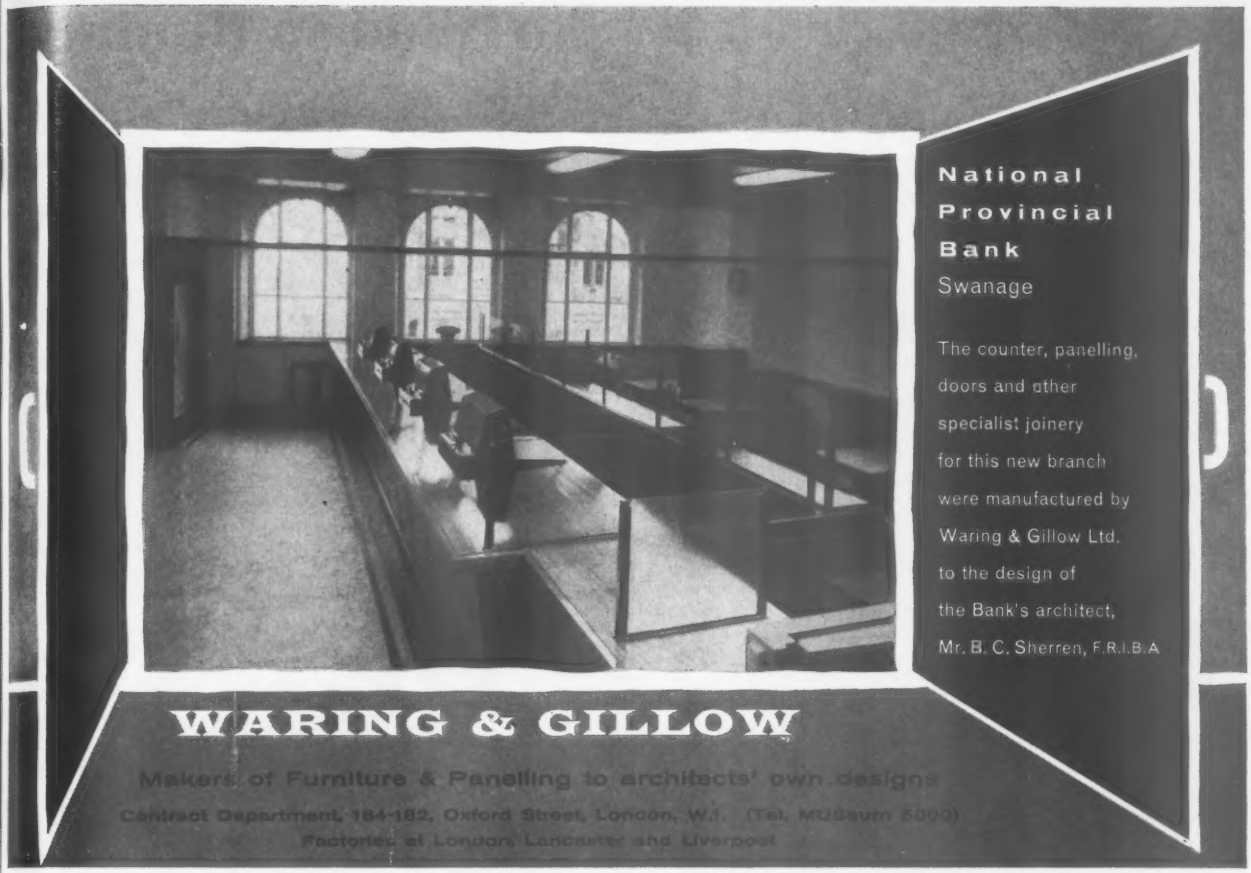
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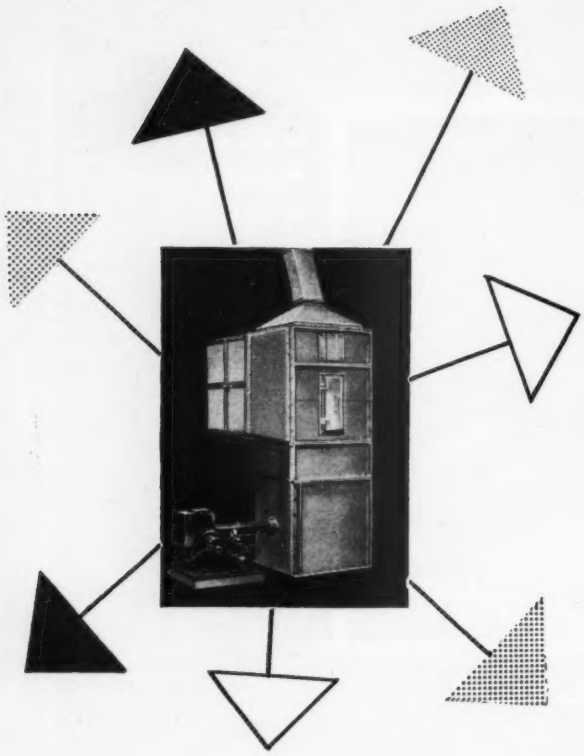
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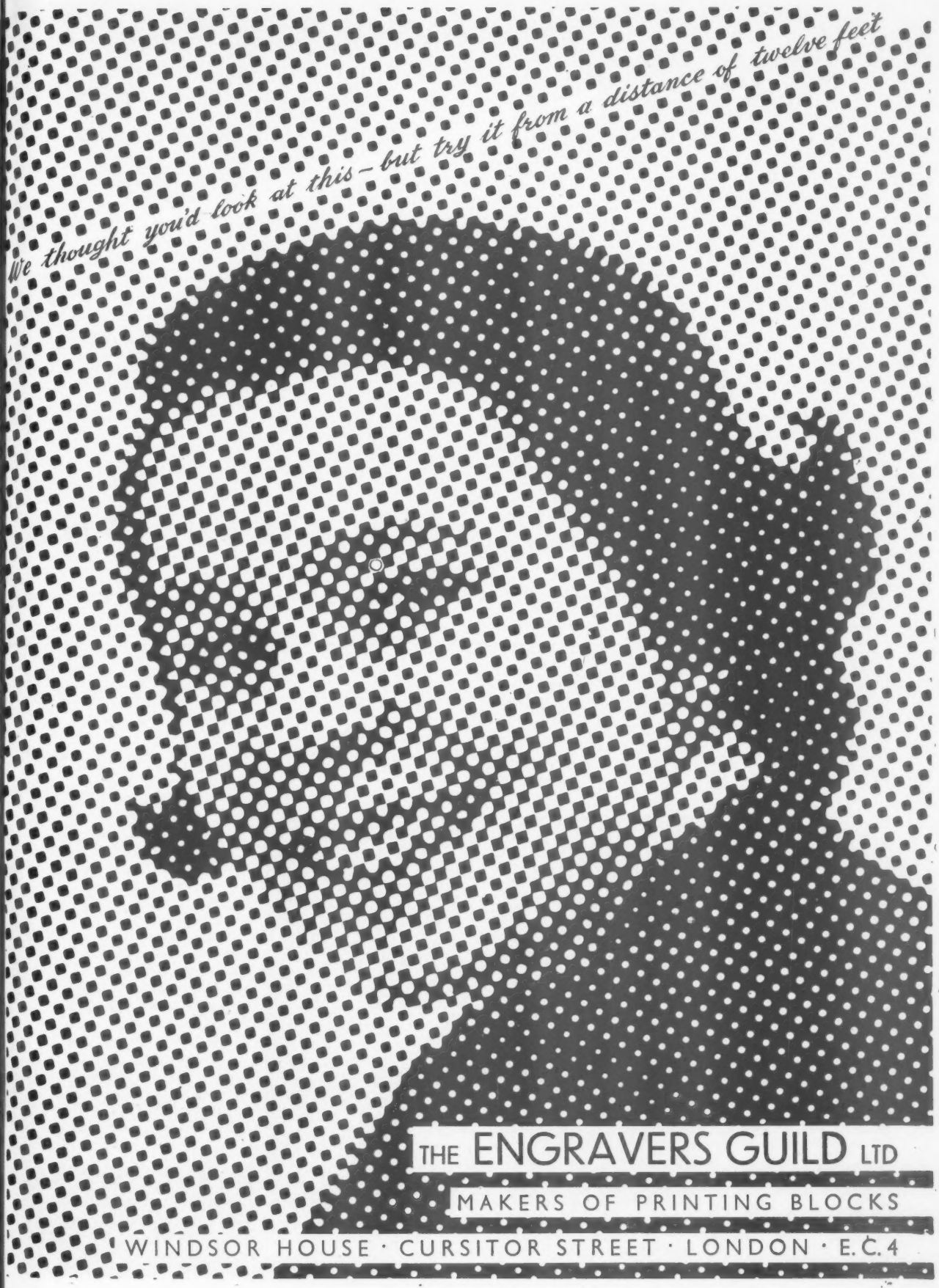
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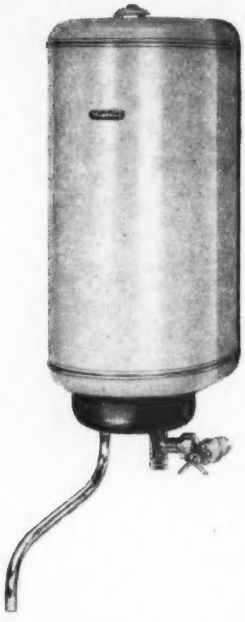



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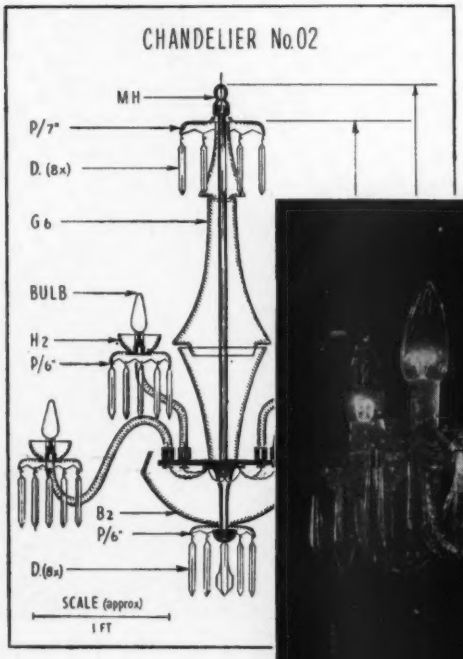


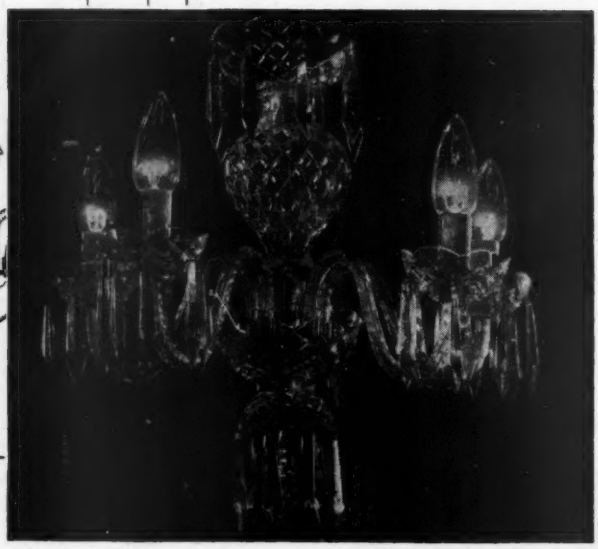
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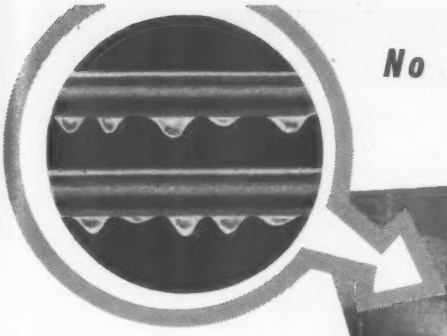
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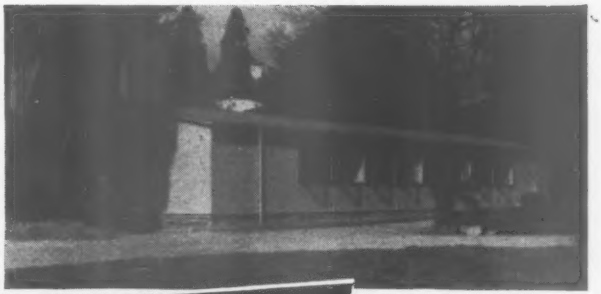
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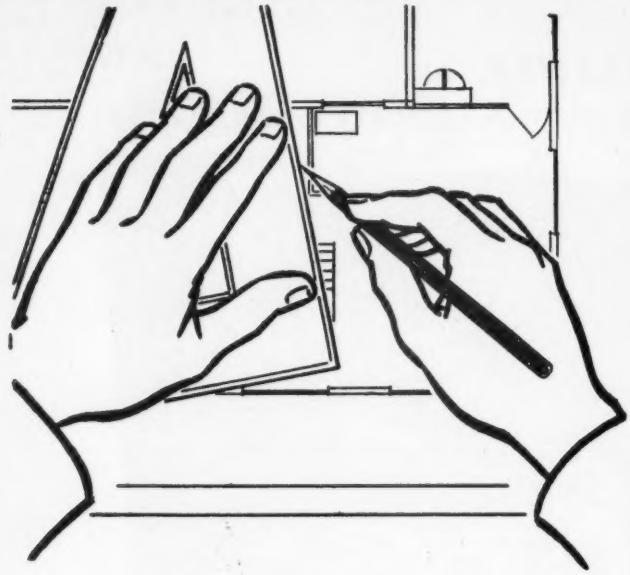
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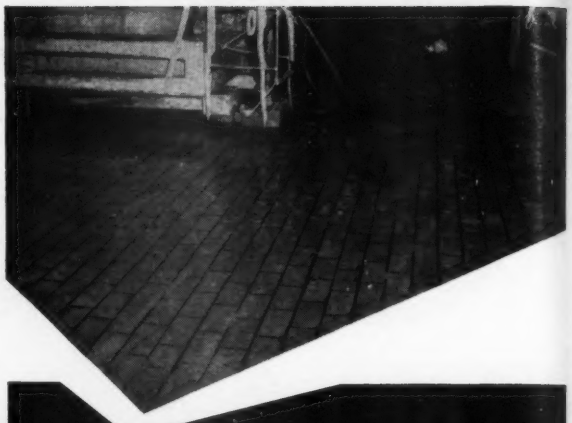
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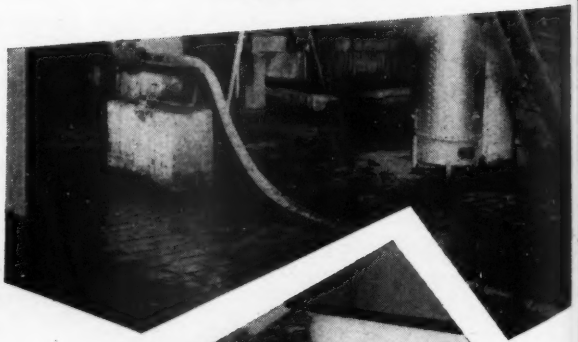
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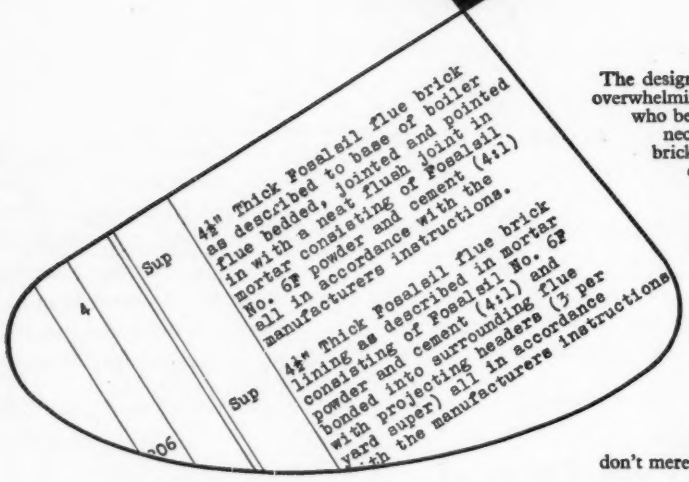
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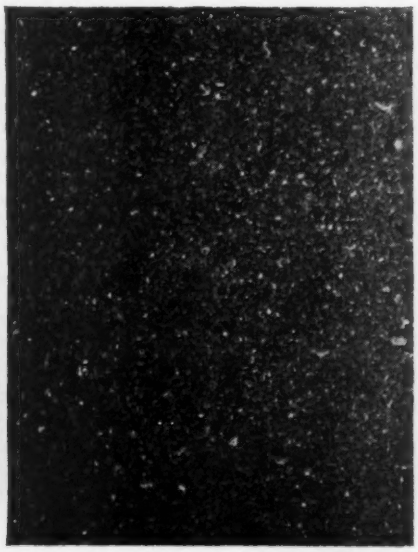
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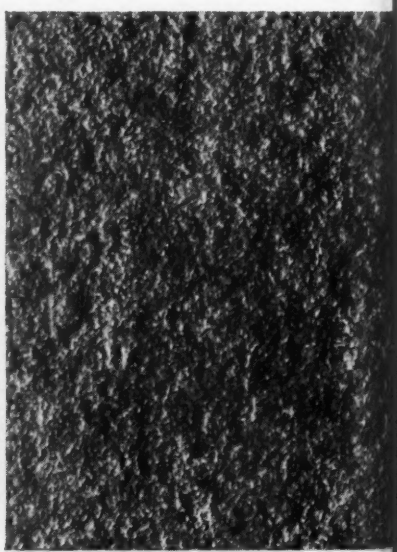
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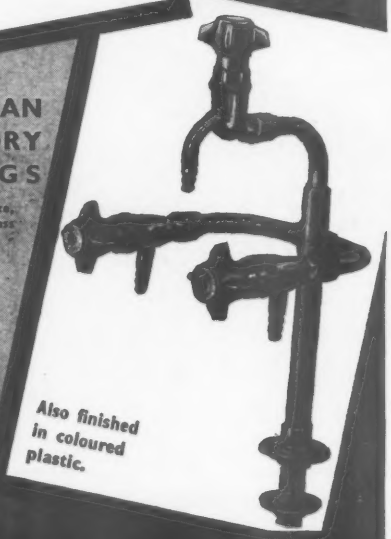
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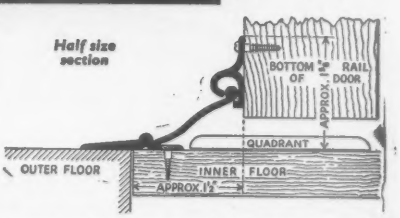
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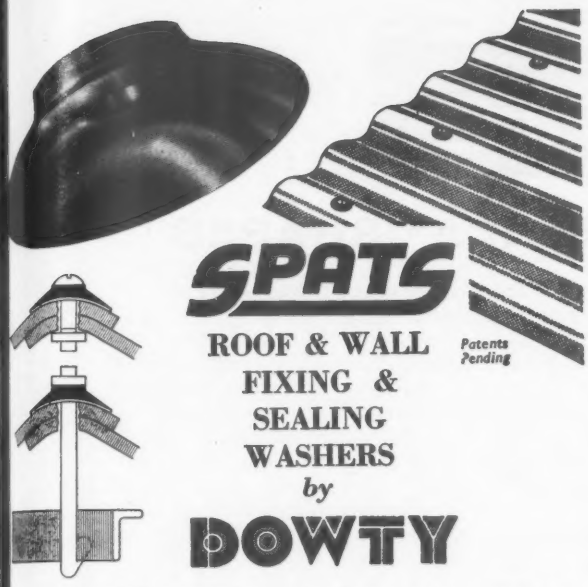
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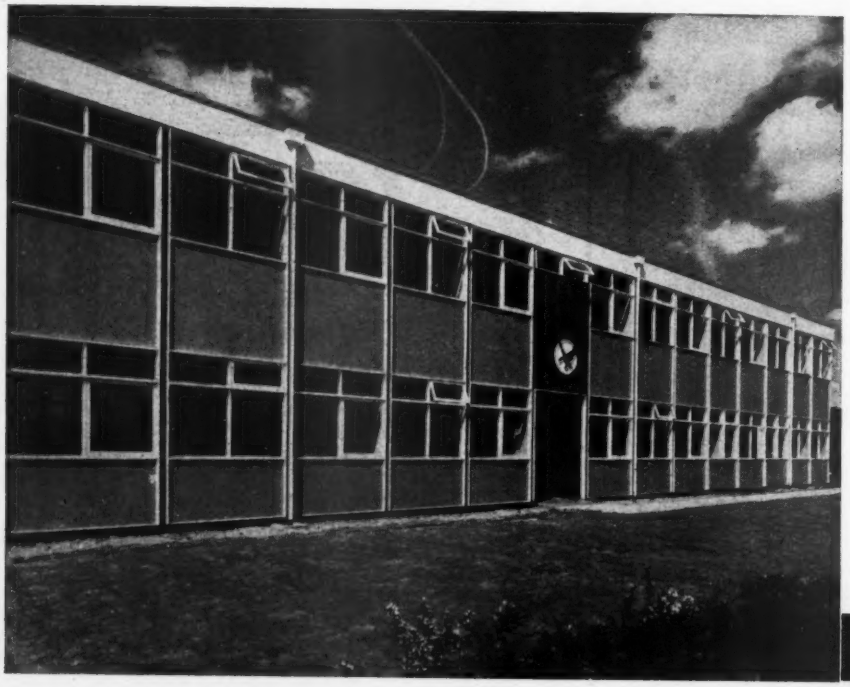
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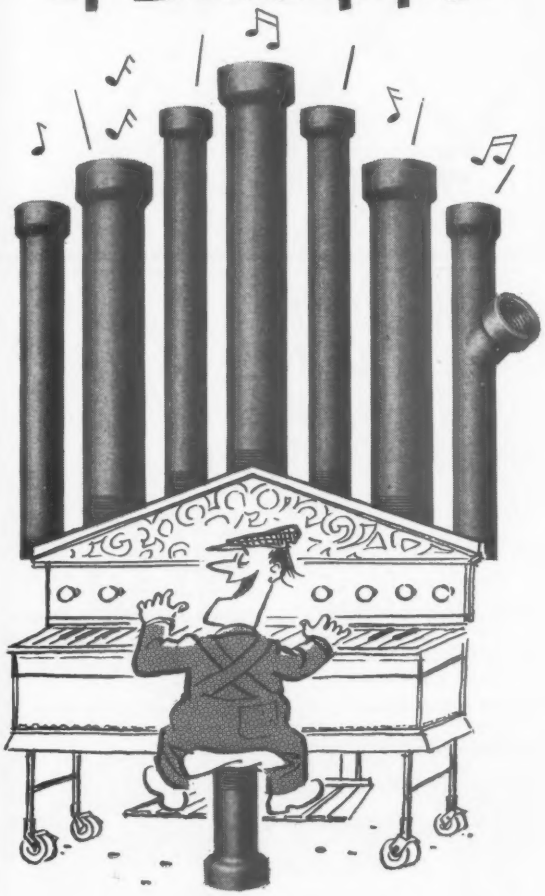
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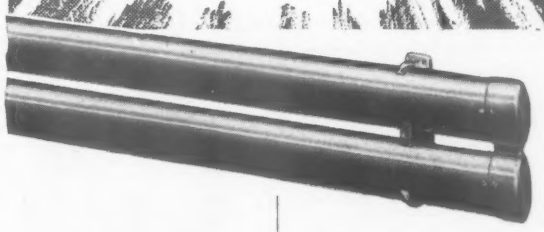
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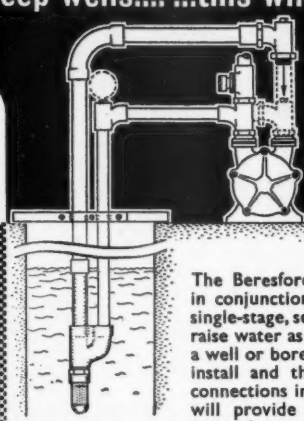
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Advertisements should be addressed to the Advt. Manager, "The Architects' Journal," 9, 11 and 13, Queen Anne's Gate, Westminster, S.W.1, and should reach there by first post on Friday morning for inclusion in the following Thursday's paper.

Replies to Box Numbers should be addressed care of "The Architects' Journal," at the address given above.

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In response to requests from a number of Overseas subscribers for air-mail delivery of Public and Official Appointment details and Other Appointments Vacant, we have been pleased to arrange that cuttings of all such classified advertisements appearing in the A.J., shall be despatched by air-mail on Wednesday of each week (one day prior to A.J. publication date). The cost of this special service to Overseas subscribers will be 5s. for four weeks (1s. 3d. for each additional week) and prepayment should be sent by readers wishing to take advantage of this service. The charge we are making represents only the actual cost of the postage involved.

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NEWCASTLE REGIONAL HOSPITAL BOARD
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Applications are invited for the following permanent (superannuable) posts on the staff of the Regional Architect.

In addition to its normal building programme the Department is concerned with the planning and execution of a number of major hospital projects and the posts offer ample opportunity for gaining all-round general as well as hospital experience, and for doing good-class work in an expanding department.

(i) **SENIOR ASSISTANT ARCHITECT.** Salary £1,010 × £30 (5) × £35 (1)—£1,195.

Applicants for this post should be registered architects and should have had experience and be capable of taking charge of the planning and construction of large public buildings. Experience of hospital planning and construction will be essential as the successful applicant will be second in charge of the Board's Newcastle Drawing Office.

(ii) **ASSISTANT ARCHITECT.** Salary £700 × £25 (3) × £30 (1) × £35 (6)—£1,015.

Applicants for this post should be registered architects and should have had practical experience of the planning and construction of public buildings. In this case the commencing salary will be fixed within the Grade by reference to relevant experience and to age.

(iii) **ARCHITECTURAL DRAUGHTSMAN.** Salary £425 at age 21 or over (subtract £20 for each year below 21) × £25 (6) × £30 (2)—£635.

Applicants for this post should have had previous experience in an architect's drawing office and be neat and quick draughtsmen. Evening study facilities are available at King's College of Durham University in Newcastle.

(iv) **SURVEYING ASSISTANT** (Lands and Buildings). Salary £525 (at age 21 or over) × £20 (4) × £25 (5)—£730.

Applicants for this post should have passed the Intermediate Examination of the Royal Institution of Chartered Surveyors, or an examination recognised by the Institution as equivalent, and should be experienced in surveying sites and buildings. The successful applicant will be required to assist with the making of a survey of all hospital sites and buildings in the Region and the preparing of record plans.

The commencing salary within the grade will depend upon the applicant's age and the amount of practical experience.

Applications, stating age, qualifications, past and present appointments, present salary and details of experience and training, together with the names of three referees (of whom at least two should be architects) should be forwarded to the Secretary to the Board, Benfield Road, Newcastle on Tyne 6 not later than 19th September, 1958. 1358

CITY OF SHEFFIELD EDUCATION COMMITTEE
COLLEGE OF TECHNOLOGY

Applications are invited for the following appointment in the Department of Building:—
LECTURER in Structural Engineering to teach Theory and Design of Structures in Sandwich courses and Higher National Certificate courses. Industrial experience and membership of an appropriate professional body are desirable.

Salary scale: £1,200 × £30—£1,350 per annum.

Forms of application, obtainable from the undersigned (s.a.e.) at P.O. Box 67, Sheffield, 1, to whom they should be returned within two weeks of the appearance of this advertisement.

T. H. TUNN,
Director of Education.
1381

BOROUGH OF CHELMSFORD
CAPITAL WORKS PROGRAMME

Applications are invited for the following new appointments in the Borough Surveyor's department consequent upon an expansion in the capital works programme:—

(*a*) ASSISTANT ARCHITECT, Special scale (£750—£1,030 p.a.).

(*b*) JUNIOR ARCHITECTURAL ASSISTANT, Grade A.P.T. I (£575—£725 p.a.) or Grade A.P.T. II (£725—£845 p.a.).

Housing accommodation available for post (*a*). Starting salary according to experience. Further particulars may be obtained from the Borough Surveyor, Municipal Offices, Chelmsford. Closing date 15th September, 1958.

B. A. FRANCIS,
Town Clerk.
1365

COUNTY BOROUGH OF SOUTH SHIELDS

Applications are invited for the following appointments in the Borough Engineer's Department.

ASSISTANT ARCHITECTS

Salary in accordance with the special scale £750 × £40—£1,030. Placing within this scale will be in accordance with experience.

Housing accommodation will be available to successful applicants if necessary.

The successful applicants will be required to pass a medical examination for superannuation purposes.

Application forms can be obtained from the Borough Engineer's Department, Town Hall, South Shields, and should be returned by 10.0 a.m. on Monday, 29th September, 1958.

R. S. YOUNG,
Town Clerk.
1415

SURREY COUNTY COUNCIL
COUNTY PLANNING DEPARTMENT
APPOINTMENT OF PLANNING ASSISTANT
Within Special (Qualified) Scale
(£750 × £40—£1,030 plus London Allowance)

Applications are invited for this appointment in the Development Plan Section of the Headquarters Staff at Kingston-upon-Thames, to be responsible for work on certain Town Maps and other Development Plan and research work. Applicants must be Corporate Members of the Town Planning Institute.

Applications endorsed "Confidential—Planning Assistant" stating age, qualifications, experience and present salary with the names and addresses of two referees must reach the County Planning Officer, "Elmhurst," Penrhyn Road, Kingston-upon-Thames, not later than 20th September, 1958. 1382

SOMERSET COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT

There is a vacancy on the established staff for an ASSISTANT ARCHITECT within the salary scale of £1,025 to £1,175 (A.P.T. Grade IV). Applicants must be associate members of the R.I.B.A.

The successful applicant will be required to control a team of architects engaged on major educational building projects.

Previous local government experience is not important but design ability of the highest standard is essential.

The Council may be able to assist in housing accommodation.

The appointment is subject to the Local Government Superannuation Acts 1937 to 1953, The National Scheme of Conditions of Service, a satisfactory medical examination and termination by three months' written notice on either side.

Applications stating age, present salary, present and previous appointments, details of training and experience together with one recent testimonial and the names and addresses of two referees should be submitted to the undersigned not later than Friday, the 26th September, 1958.

R. O. HARRIS, F.R.I.B.A.,
County Architect.

Park Street,
Taunton,
5th September, 1958. 1417

CITY OF SHEFFIELD
CITY ENGINEER & SURVEYOR'S DEPARTMENT
PLANNING ASSISTANTS

Applications are invited from suitably qualified persons for the following appointments on the permanent staff of the City Engineer & Surveyor & Town Planning Officer (H. Foster, M.A., M.I.C.E., M.I.Mun.E.).

SENIOR PLANNING ASSISTANTS, Grade A.P.T. V (£1,175—£1,325 p.a.).

GENERAL PLANNING ASSISTANTS, Grade A.P.T. III (£845—£1,025 p.a.).

Candidates for the senior posts must possess both Planning and Architectural experience and will be required to be Members of either the Town Planning Institute or the Royal Institute of British Architects.

Qualifications required for the post of General Planning Assistant is A.M.T.P.I.

Superannuable posts, N.J.C. Conditions of Service, Medical Examination.

Applications, stating age, education and training, qualifications, experience present and past appointments (with dates and salaries) and quoting the names of two referees should be submitted to the undersigned by the 3rd October, 1958.

JOHN HEYS,
Town Clerk.

Town Hall,
Sheffield, 1. 1377

CLARE RURAL DISTRICT COUNCIL
APPOINTMENT OF HOUSING ASSISTANT

Applications are invited for the appointment of Housing Assistant at a salary within A.P.T. Grade II (£725—£845 per annum) according to experience and qualifications, together with a travelling allowance applicable to a car not exceeding 10 h.p. or 1,199 c.c.

The appointment will be subject to the Local Government Superannuation Acts, to the satisfactory passing of a medical examination, and to one month's notice on either side.

Preference will be given to suitable applicants who possess the Intermediate R.I.B.A. certificate, and who have had experience in local authority housing work, including new housing.

Housing accommodation will be available to the successful applicant, if married, and consideration will be given to the payment of one half of reasonable removal expenses.

Applications, stating age, qualifications and experience, together with the names and addresses of two persons to whom reference may be made, must be received by the undersigned not later than 25th September, 1958.

J. ALLPRESS,
Clerk of the Council.

Stonehall,
Clare,
Suffolk.
4th September, 1958. 1403

CITY OF SHEFFIELD
CITY ENGINEER & SURVEYOR'S DEPARTMENT
ASSISTANT STRUCTURAL ENGINEER, SPECIAL CLASSES GRADE

Applications are invited from qualified Structural Engineers, for the position of Assistant Structural Engineer, on the Staff of the City Engineer and Surveyor and Town Planning Officer (H. Foster, M.A., M.I.C.E., M.I.Mun.E.). The post is established in the Special Classes Grade (£750—£1,030 p.a.).

Candidates will be required to work in the Building Surveyor's Section of the Department, and should be capable of dealing with all kinds of structural proposals under the various codes of practice.

Superannuable post, N.J.C. conditions of service, medical examination.

Applications, stating age, education and training, qualifications, experience, present and past appointments (with dates and salaries), and quoting the names of two referees, should be submitted to the undersigned by the 26th September, 1958.

JOHN HEYS,
Town Clerk.

Town Hall,
Sheffield, 1. 1416

CITY OF NOTTINGHAM
ESTATES DEPARTMENT

Applications are invited for the following appointments in the Chief Architect's Section:—

(1) **ASSISTANT ARCHITECT** at a commencing salary within the Special Scale (£750 × £40—£1,030). Applicants should have passed Parts 1 and 2 of the Final Examination of the R.I.B.A.

(2) **JUNIOR ARCHITECTURAL ASSISTANT** at a commencing salary within the General Division Scale (£200—£560).

There is a large programme of interesting and varied work covering redevelopment schemes and estate development, which includes housing, shops, hostels, etc.

The appointments will be subject to the National Joint Council's Scheme of Conditions of Service.

Applications stating age, qualifications, experience, present appointment and salary, and naming two referees, should be sent to the Estates Surveyor and Valuer, Guildhall, Nottingham, by Friday, 26th September, 1958.

T. J. OWEN,
Town Clerk.

Guildhall,
Nottingham. 1376

COUNTY BOROUGH OF WEST HAM
BOROUGH ARCHITECT AND PLANNING OFFICER'S DEPARTMENT

Applications invited for established post of PLANNING ASSISTANT, A.P.T. Grade I—£575 × £30—£725 p.a., and London Allowance. Preference given to applicants who have passed the T.P.I. Intermediate Examination. Starting point in Grade according to qualification and experience. Application form and details from Borough Architect and Planning Officer, 70, West Ham Lane, Stratford, E.15, returnable by 23rd September, 1958. 1375

COUNTY BOROUGH OF DONCASTER

Applications are invited for a post of ASSISTANT ARCHITECT in the Borough Architect's Department. Salary in accordance with the Special Grade (£750—£1,030 by £40 increments).

Applicants must be Associates of the R.I.B.A. and have had good experience in design and working drawings.

The appointment will be subject to one month's notice on either side and to the terms of the Local Government Superannuation Acts 1937 to 1953. The successful applicant will be required to pass a medical examination.

Application forms may be obtained from the Borough Architect, L. J. Tucker, Esq., A.R.I.B.A., F.I.Hsg., 15 South Parade, Doncaster, to whom they must be returned by 10 a.m. on Monday, 29th September, 1958.

H. R. WORMALD,
Town Clerk.

1, Priory Place,
Doncaster.
29th August, 1958. 1380

COVENTRY

ARCHITECTS. A.P.T. IV (£1,025 × £50—£1,175). Salary within grade if appropriate. Considerable all round experience and the ability to assume responsibilities required of a Senior member of an Architectural Group.

Housing accommodation may be available. Removal expenses loan.

Application form, etc., from City Architect and Planning Officer, Bull Yard, Coventry, returnable within 10 days of publication. 1383

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Special Scale (£750—£1,030)

SENIOR ARCHITECTURAL ASSISTANT

A.P.T. II (£725—£845)

Applications are invited for the above posts.

Particulars of the appointments may be obtained from Borough Architect, Grange House, Stockton Road, Sunderland.

Applications must be addressed to me and received at my office, Town Hall, not later than 22nd September, 1958.

Canvassing will disqualify.

G. S. McINTIRE,
Town Clerk.
1379

LANCASHIRE COUNTY COUNCIL

SECTIONAL PLANNING OFFICER. Salary within Special Scale/A.P.T. Grade IV (£750—£1,175 per annum) required at the Divisional Planning Office, Liverpool.

Candidates should possess a recognized qualification in architecture, civil engineering, surveying and/or planning. A thorough knowledge of Town and Country Planning legislation is essential and experience in Town Map preparation would be an advantage.

Applications, giving age, qualifications, present appointment, experience, etc., and two referees to the County Planning Officer, East Cliff County Offices, Preston, by 22nd September, 1958. 1378

HAMPSHIRE COUNTY COUNCIL—PLANNING ASSISTANT, A.P.T. Grade II (£725—£845) required for County Planning Department Headquarters in Winchester. Candidates should preferably have passed the Intermediate examination of the Town Planning Institute or of a related professional body and have had experience with a Local Planning Authority. The appointment is pensionable and subject to a satisfactory medical report. In approved cases the County Council assist with removal and other expenses.

Applications stating age, education, qualifications and experience, together with a copy of one testimonial and the names of two referees should reach the Clerk of the County Council, The Castle, Winchester, by 23rd September. 1371

GOVERNMENT OF SEYCHELLES

ARCHITECT, PUBLIC WORKS DEPARTMENT

To design and plan all types of small industrial, school and hospital buildings and of dwelling houses. To carry out the town planning and zoning of small townships; practical supervision of building construction and specifications. The Officer may be required to assist generally in the supervision of Public Works.

Contract appointment for one tour of three years. Salary £1,500 a year. Gratuity of £37 10s. for each completed 3 months service payable on satisfactory completion of contract. Income tax at local rates.

Free passages provided up to three adult passages. New furnished government quarters, at moderate rental. Generous leave.

Candidates must be A.R.I.B.A. and have at least 5 years' practical experience including tropical design and building. Town planning experience is desirable.

Write Director of Recruitment, Colonial Office, London, S.W.1, stating briefly age, qualifications and experience quoting BCD 112/54/03. 1370

ST. THOMAS' HOSPITAL
LONDON, S.E.1

Required, for the Architect's Department, for work on the design and construction of an extensive rebuilding scheme forming part of the South Bank Development, the following:—

(*a*) ASSISTANT ARCHITECTS, A.R.I.B.A., a good knowledge of Design and experience of preparing W.D.'s essential. Salary £780 × £3 (30)—£870.

(*b*) ARCHITECTURAL ASSISTANTS, R.I.B.A., Intermediate standard, to R.I.B.A. Final standard. Office experience not essential. Salary from £550 to £775, according to qualifications and experience.

Applications, giving particulars of qualifications, age, and experience, together with the names of two referees, to the Architect, St. Thomas' Hospital. 1369

COUNTY BOROUGH OF WALSALL
PUBLIC WORKS DEPARTMENT

Applications are invited for the appointment of ARCHITECTURAL ASSISTANT, Grade A.P.T. I at a commencing salary of £575 rising by annual increments to a maximum of £725.

Applicants must have passed the Intermediate examination of the R.I.B.A.; the post is superannuated and the person appointed will be required to pass a medical examination.

Applications giving names of two persons to whom reference may be made and stating age, present position, salary, qualifications and details of experience should be submitted to the undersigned not later than Friday, 26th September, 1958.

M. E. HABERSHON,
Borough Engineer and Surveyor.
Council House,
Walsall.
September 4th, 1958. 1402

GOVERNMENT OF NORTHERN IRELAND

ASSISTANT QUANTITY SURVEYOR

Applications invited from Associates of the Royal Institution of Chartered Surveyors (Quantities) for pensionable post in the Chief Quantity Surveyor's Branch, Ministry of Finance. Experience in "taking off" for large building works essential. Salary scale £780 (age 25)—£1,055 (age 34 or over)—£1,215. Preference for ex-Servicemen. Application forms, obtainable from Secretary, Civil Service Commission, Stormont, Belfast, to be completed and returned by 29th September, 1958. 1414

NORFOLK COUNTY COUNCIL

APPOINTMENT OF DEPUTY COUNTY PLANNING OFFICER

Applications are invited from suitably qualified persons for the above post, on J.N.C. Scale "D" (£1,405—£1,625).

The appointment is subject to the normal conditions of service applicable to posts on the J.N.C. Scales.

Applications must be received by the undersigned by the 26th September, 1958.

F. P. BOYCE,
Clerk of the Council.
County Offices,
Thorpe Road,
Norwich. 1318

METROPOLITAN POLICE RECEIVER'S OFFICE REQUIRES

(*i*) TECHNICAL ASSISTANT for study of building methods, materials, contracts and specifications. Scale £695—£870; maximum starting £745. Intermediate R.I.C.S. (Building) standard or Ordinary National Certificate.

(*ii*) ARCHITECTURAL DRAUGHTSMEN. Starting pay £550 age 21—£755 according to age and sex. Salary maximum £870. Ordinary National Certificate or equivalent.

Five-day, 42-hr. week, paid leave, canteen facilities. Apply giving qualifications, experience, age and nationality, Room 578, (AJ), Receiver's Office, New Scotland Yard, S.W.1. 1401

BOROUGH OF THORNABY-ON-TEES

ASSISTANT ARCHITECT

Applications are invited from candidates who have passed the Intermediate R.I.B.A. for this appointment in the Borough Engineer's Department in accordance with the National Scheme of Conditions of Service on Grade A.P.T. II (£727 × £30—£845).

Housing accommodation will be provided if required, and half removal expenses paid.

Applications stating qualifications and experience and giving names and addresses of two referees should be delivered to the Borough Engineer, Town Hall, Thornaby-on-Tees, not later than 30th September, 1958.

A. STOCKWELL,
Town Clerk.
1418

MINISTRY OF EDUCATION require ASSISTANT ARCHITECT in Development Group of Architects and Building Branch. Work consists of study in principle and detail of design and construction of educational buildings and of their services, fittings and furniture; and application of results to school projects. Post unestablished at first, but possibility of establishment later. Appointment in Basic Grade, on salary scale £805 rising to £1,250. Starting salary according to age, but will not normally be higher than £1,085.

Forms from M.L.N.S. Technical and Scientific Register (K), 26, King Street, London, S.W.1. Quoting J.123/8A. 1419

Architectural Appointments Vacant

4 lines or under, 9s. 6d.; each additional line, 2s. 6d. Box Number, including forwarding replies, 2s. extra

CO-OPERATIVE WHOLESALE SOCIETY LTD. ARCHITECT'S DEPARTMENT, MANCHESTER

APPLICATIONS are invited for the appointment of ASSISTANT ARCHITECTS with experience of work on commercial and industrial projects, capable of preparing working drawings from preliminary details. Five-day week in operation. Applications stating age, experience, qualifications and salary required to G. S. Hay, A.R.I.B.A., Chief Architect, Co-operative Wholesale Society, Ltd., 1, Balloon Street, Manchester, 4. 9585

BUCKINGHAMSHIRE firm of Architects within 30 miles of London with a varied practice, require an ARCHITECTURAL ASSISTANT at Final R.I.B.A. Standard. Five-day week. Salary according to age and experience. Please write giving full particulars to Box 1202.

SENIOR ASSISTANT required, capable of taking full responsibility of contracts, dealing with Client and Contractor. Must belong to the Modern School of Design. State age, experience and salary required to John H. D. Madin, Dip. A.R.I.B.A., 83/85, Hagley Road, Birmingham, 16. 1235

ARCHITECTURAL ASSISTANTS required. Must be good draughtsmen and have not less than five years' office experience. Apply in writing to Llewellyn Smith & Waters, 103 Old Brompton Road, S.W.7. 1277

ASSOCIATE, R.I.B.A., about 40 years of age, required for senior position with firm of food manufacturers south of London. Salary £1,500 to £2,000 p.a. Box 1265.

INTERMEDIATE ASSISTANT required by Architects, Five Ways, Birmingham. Varied work in Midland and London areas. J. Seymour Harris & Partners, 3/4, Greenfield Crescent, Five Ways, Birmingham. 1262

TREHEARNE & NORMAN, PRESTON & PARTNERS have a vacancy for a SENIOR ASSISTANT. Salary according to experience and qualifications. Apply: 83, Kingsway, W.C.2 (HOL 4071). 1259

TWO INTERMEDIATE ASSISTANTS required for varied and interesting contemporary projects. State age, experience and salary required, to John H. D. Madin, Dip. A.R.I.B.A., 83/85, Hagley Road, Birmingham, 16. 1236

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ASSISTANT ARCHITECT required for busy private office. Apply stating age, experience and salary required to Douglas Crawford & Ellis, F.R.I.B.A., 10, Market Place, Bishop Auckland, Co. Durham. 1346

ARCHITECTURAL ASSISTANT of Intermediate standard with industrial experience required for work on Atomic Power Stations. Excellent opportunities in an expanding London office. Apply stating age, experience, and salary range, to The Chief Architect, Nuclear Civil Constructors, 52/55, Carnaby Street, London, W.1. 1347

SOUTHEND-ON-SEA. ARCHITECTURAL ASSISTANT required for school and general practice. Some experience necessary, R.I.B.A. Final standard. Age about 25-30. Apply giving details of experience and salary required to: Burles & Newton, A./A.R.I.B.A., 36-38, County Chambers, Weston Road, Southend-on-Sea. 1340

ARCHITECT' Office, Charing Cross, requires qualified and Intermediate ASSISTANTS. Varied type of work. Good salaries commensurate with experience. Five-day week. Write Box 1333

ARCHITECTS' Office, Charing Cross, requires JUNIOR ASSISTANTS or beginners. Varied type of work. Good salaries commensurate with experience. Five-day week. Write Box 1334.

EXPERIENCED ASSISTANT ARCHITECT required. Must have design and constructional ability, initiative and drive. Fully qualified assistant preferred, but a suitable experienced Intermediate R.I.B.A. would receive due consideration. Numerous interesting projects throughout the country. Permanent post with scope for advancement. Superannuation scheme and canteen facilities. Salary to be arranged by appointment. Apply, giving age and experience, direct to D. Greenwood, B.Arch., A.R.I.B.A., Prices Tailors Ltd., Cardigan Crescent, Leeds, 4. 1310

FULLY Qualified SENIOR ASSISTANT ARCHITECT required to act as leader in a team of three assistants. Must be capable of designing, preparing working drawings and supervision of large building contracts. Pension scheme. Canteen facilities. Salary range approximately £1,000 p.a. Apply, giving age, experience, etc., to Prices Tailors Ltd. 1335

QUALIFIED ARCHITECT required by Building Contractors, South Bucks, to open up department dealing with the design and development of Housing Estates, Industrial premises etc. An excellent opportunity for a keen and ambitious man. Permanent position. Pension Scheme. Write, in confidence, giving full details including age, and expected salary to Box 1407

BREWERY Company requires ARCHITECTURAL ASSISTANT, Intermediate standard. Experience in working drawings and preparation of specifications. Work consists of extensions and alterations to licensed premises. Pension scheme. Apply giving full details with salary required to: Secretary, Threlfall's Brewery Company, Limited, 21, Trueman Street, Liverpool, 3. 1325

ARCHITECTURAL ASSISTANTS required. Starting salary £750. Box 1316.

ARCHITECTURAL ASSISTANT of R.I.B.A. Intermediate standard required for private office with varied and interesting work. Applicants must be capable draughtsmen, able to make surveys and produce working drawings, and details of modern buildings. Write details and salary required to W. J. Lewis & Sons, 68, Cranbrook Road, Ilford, Essex. 1314

ROBERT MATTHEW & JOHNSON-MARSHALL have a few vacancies in their London office for qualified ARCHITECTS with 2-4 years' experience. Please apply in writing to 24 Park Square East, London, N.W.1. 1311

ARCHITECTURAL ASSISTANT, 30-35, required by well-known London firm as resident in West Africa. Experience tropical architecture preferred. Salary according to experience. Box 1308.

DAVID ROBERTS requires by November, ARCHITECTURAL ASSISTANT, school trained with one to two years' experience. Reply, stating age and Salary required to 31B Magdalene Street, Cambridge. 1413

ASSISTANT required, Intermediate standard or thereabouts, for small practice. Salary according to experience. Write or phone Challen & Floyd, 7, Cromwell Road, London, S.W.7. KENsington 8334. 1405

ARCHITECT'S ASSISTANT, Intermediate standard, required for busy Hampshire office. Please reply to Box 1263.

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ARCHITECTURAL ASSISTANT of Intermediate or near Final R.I.B.A. standard required by a Birmingham Brewery to work on a varied and interesting programme. Experience in Industrial Building design desirable. Pension Scheme, Canteen, Sports Grounds and other amenities available. Write stating age and previous experience to:—Staff Manager, Mitchells & Butlers Ltd., Cape Hill Brewery, Birmingham. 1422

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ARCHITECTS (City) require ASSISTANT with experience of Industrial and Commercial projects. Salary £600—£800. Box 1420.

WANTED in London office of A.R.I.B.A. engaged on work for Housing Company, ARCHITECTURAL ASSISTANT, Inter. R.I.B.A. standard. Experience in preparation of Sketch Designs, Working Drawings and Specifications essential. Salary according to experience and capabilities. Box 1384.

BREWERY COMPANY in the West Riding of Yorkshire requires an ARCHITECTURAL ASSISTANT (not over 45), capable of proceeding from sketch stage to completion in new or alteration building schemes. Must be first class draughtsman experienced in planning, design, and detailing. Previous engagement on similar work; also knowledge of Quantity Surveying and Building Costs desirable. Salary commensurate with ability of applicant. Full details of training, experience and present salary to Box 1372.

ARCHITECTURAL ASSISTANT required by Wates Ltd. Experience in speculative housing work essential. Salary range £700 to £900 per annum. Five-day week, pension, bonus. Write stating age, experience and present salary to Personnel Manager, at 1,258/60, London Road, Norbury, S.W.16. 1385

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Please reply in writing to: 2, Field Court, Gray's Inn, London, W.C.1. 1387

EXPERIENCED ARCHITECTURAL DRAUGHTSMAN required, preferably with knowledge of joinery detailing, for firm specialising in wide range of interior work. R. D. Russell & Partners, Knightsbridge 0136. 1394

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LANCHESTER & LODGE require ASSISTANT ARCHITECT. Varied and interesting work on laboratory buildings, etc. Five-day week and L.V.'s. Write full particulars, including salary required, 10, Woburn Square, W.C.1. 1397

EXPERIENCED ARCHITECTURAL ASSISTANTS required for busy private practice in West End. Salary according to age and experience. Write giving brief particulars, present salary, etc., Box 1396.

ARCHITECTURAL ASSISTANT of contemporary outlook required from about Intermediate standard to recently qualified, for practice mainly concerned with large commercial projects. Five-day week. Congenial working conditions. Good salary by arrangement. Apply in writing, giving details of architectural education, age and experience to J. Alfred Harper & Son, Union Chambers, 63, Temple Row, Birmingham, 2. 1395

JUNIOR and SENIOR ARCHITECTURAL ASSISTANTS required. Commercial office experience desirable. Five-day week. Lewis Solomon, Kaye & Partners, Thavies Inn House, Holborn Circus, E.C.1. City 8811. 1404

ARCHITECTURAL ASSISTANT urgently required, Intermediate standard, for busy office in Holborn area. Box 1393.

TWO SENIOR ARCHITECTS required immediately in busy and varied practice in the West Riding of Yorkshire. Applicants should be Associate Members of the R.I.B.A. and have had considerable experience, preferably some pre-war experience. Salary up to £1,700 per annum according to experience. Non-contributory pension scheme in operation and good prospects for promotion. Apply, giving full particulars of experience, qualifications, etc., to Box 1392. Closing date for applications 18th September, 1958.

ARCHITECT'S ASSISTANT required, R.I.B.A. —Intermediate standard. Experienced in preparation working drawings, details, etc. Measurement of existing buildings. Commercial work generally. Five-day week. Salary according to ability and experience. Apply: E. H. Davie, F.R.I.B.A., A.M.T.P.I., Chief Staff Architect, Hillier, Parker, May & Rowden, 77, Grosvenor Street, London, W.1. MAYfair 7666. 1391

ASSISTANT required in London Office, capable in design work and working drawings. Salary according to experience. Reply Box 1390.

LONDON Office requires ARCHITECTURAL ASSISTANTS. Experience in Hospital work desirable but not essential. Permanent positions. State experience and salary expected. Box 1389.

SENIOR experienced ASSISTANT required. Interesting work with opportunity for individual responsibility. Apply in writing, stating age, experience and salary required to Devereux and Davies. 1388

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CO-OPERATIVE WHOLESALE SOCIETY LTD. Architect's Department, London. WORKER-UP. Applications are invited from suitably qualified and experienced persons. Salary according to age, qualifications and experience. The post is superannuable, subject to medical examination. Five-day week in operation. Applications, stating age, experience, qualifications and salary required to:—W. J. Reed, F.R.I.B.A., Chief Architect, Co-operative Wholesale Society Ltd., 99, Leman Street, London, E.1. 1204

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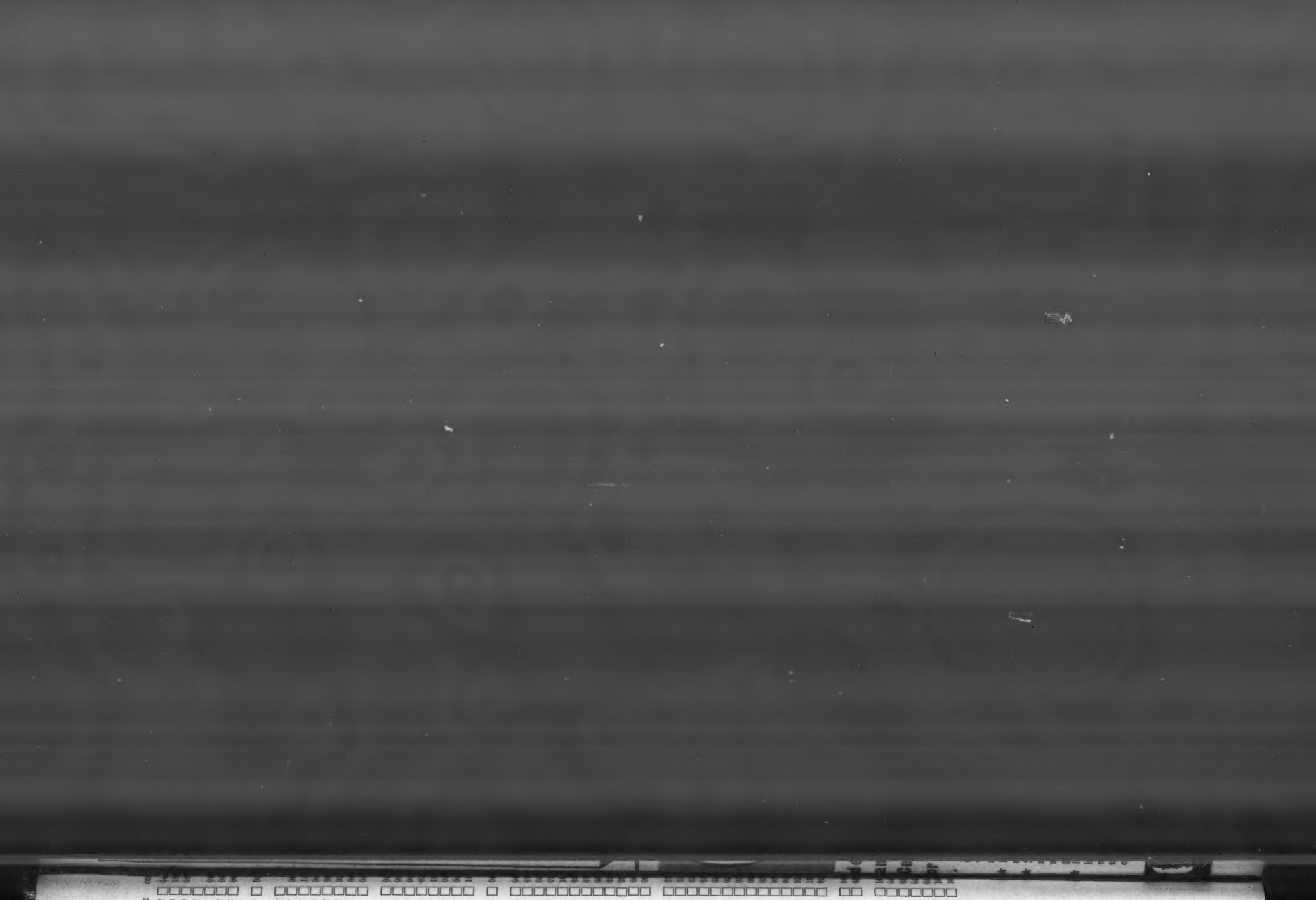
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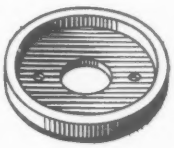
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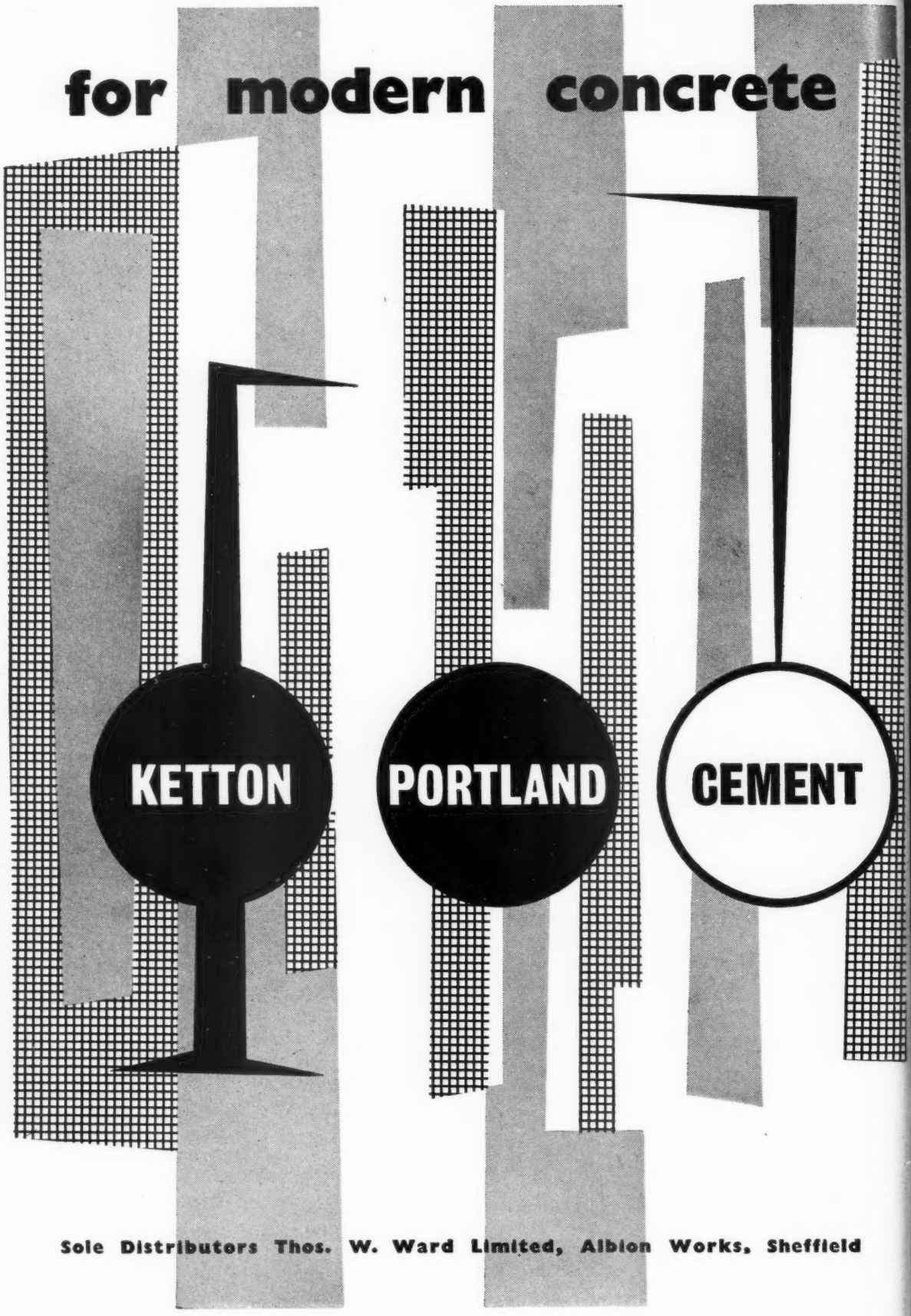
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